SUMMARY OF TEN MAJOR SCHOOL PRECISION TEACHING PROGRAMS

by

Peggy L. Albrecht

B.S., Montana State University, 1966
M.Ed., University of Montana, 1978

Submitted to the Department of Educational Policy and Administration and the Faculty of the Graduate School of the University of Kansas in partial fulfillment of the requirements for the degree of Doctor of Philosophy.

Acknowledgements

Thank you seems such a small phrase to express my gratitude for the all of the support I have received. However, without that support the last two years would have been much harder to accomplish.

Thank you:

First to my children, Chris and Kelly, whose love, support, and personal sacrifice made this all possible.

To Terry, for letting go.

To my parents, for the foundation provided.

To Ray, for his belief in my abilities and always expecting me to go on and do better things.

To Og, for posing the challenge, stretching my imagination, and providing the knowledge and opportunities for growth.

To Jerry Chaffin, Bill Holloway, and Jerry Bailey, for their support, knowledge, and help.

To Dave, whose friendship, patience, and words of encouragement gave me strength, for always being there when I needed him and for giving me a new life to look forward to.

Thank you all for helping me to realize my dreams.

TABLE OF CONTENTS

List of Tables

List of Figures

Chapter 1

Introduction

The current emphasis on increased quality of education, accountability, and meritorious recognition of teachers who achieve the goal of education, student learning, requires educators to focus on objective measures of student learning.

School effectiveness studies have looked at many aspects of schooling. Beginning with the Coleman Report (1966), almost twenty years ago, studies have looked at such factors as family background, class size, teacher salaries, number of library books, reading series, facilities and compensatory programs. Recently, field studies have investigated the relationship of school climate, district structure, time on task, planned change in schools, and leadership style to academic achievement. The renewed interest in merit pay for teachers brings again to the forefront a need for an objective, fair evaluation of teacher effectiveness and student learning.

How might education be made accountable? What outcome factors can be monitored and measured? How can teacher effectiveness be recorded objectively and equitably, given the many variables involved? Have districts started to change the process of accountability, measuring student progress rather than student achievement?

Need for the Study

The elusiveness of the "art" of teaching deters successful monitoring of the goal of education, student learning. The variety of approaches and models across curriculum areas and even within areas appears to prevent consistent, reliable data gathering on student learning.

Direct and daily monitoring and measurement of student learning through Precision Teaching and Standard Celeration Charting provide objective data gathering and decision making capabilities. Precision Teaching has been used to monitor student learning in school districts since the late 1960's. The need exists then, to determine the status of Precision Teaching programs which have been implemented in districts across the U.S.

Standardized tests, while used widely by school districts, have many recognized problems. Soar, Medley, and Coker (1983) reject the use of student achievement tests as a measure of teacher effectiveness for three reasons; student variablity, regression effect, and the limitations of current achievement tests. So while standardized achievement tests continue to be used by most districts, their usefulness is limited.

"Experts" in education offer various theoretical underpinnings and many different techniques to solve the same problem. Each theory has its own followers contending that their approach is the best one to use.

School effectiveness research has produced conflicting results; the same procedures have had positive, negative, and no change results at different times. The wide range of contradictory results are difficult to explain within any given theoretical context. Weick (1976), in applying loose coupling theory, states that these contradictions may be the result of changes in the couplings within or across the organizations. If each researcher views the organization from a different vantage point, or at another point in time, the perspective and results may be quite different. Dunkin and Biddle (1974) state that "...successful teachers orchestrate a whole array of factors, each of which makes a little difference, in a complex system of interactions through which meanings and attitudes are derived."

Koenig (1972) discussed the development of a "science of education" and evaluated the use of the Standard Celeration Chart (called the Standard Behavior Chart at that time) as a tool to help education reach this goal. He recommended that the Standard Celeration Chart and Precision Teaching, the application of charting to education, be used to advance this science.

The Seattle, Spokane, Tacoma (SST) Project in the state of Washington (1971) used Precision Teaching as a means of identifying learning disabled students and then as a technique to remediate those learning deficits. The Minneapolis Public Schools in 1972 instituted a project

called Systematic Instructional Management Strategies (SIMS) to remediate learning disabled students in the areas of reading and language, and used the Standard Celeration Chart (SCC) as the monitoring and decision making device. In 1973, the Great Falls Public Schools of Great Falls, Montana began a program entitled "Remediation of Children with Learning Deficits through Precision Teaching" which later became the district's model for their learning disablities resource rooms. These projects are examples of attempts made by school districts to monitor student learning in the area of special education during the late 1960's and early 1970's through Precision Teaching. Since that time, Precision Teaching has been used both in regular and special education programs from pre-school through college.

Purpose of this study

The purpose of this study is to trace the use of Precision Teaching in public and private schools from its beginning in the mid 1960's to the present to determine the durability or staying power of Precision Teaching in a district. Precision Teaching training has been provided to over 2000 school districts over the last ten years, 1200 districts by the Great Falls Project alone as part of their national dissemination efforts. Precision Teaching is taught as a course or as part of other courses in at least fifteen colleges and universities in the United States and Canada and

eleven major college texts cite Precision Teaching.

A conservative estimate of districts currently using Precision Teaching on a daily basis to monitor student growth is 1000 districts in at least 42 states and 3 provinces of Canada. Approximately 20,000 teachers have been trained either through an in-service or pre-service program.

The intent of the study is to select a representative sample of districts which have implemented Precision Teaching during the decade of the 70's, including programs which are no longer in existence and programs which have sucessfully continued, and compare and contrast their success or failure. Variables and trends that enhance the success and continuation of the program within a district as well as locate the variables which seem to terminate a program will be identified.

The study will examine the effects of funding sources, area of emphasis, level and type of support within the districts, intensity and variety of use, effect of change of any given variable on the total program, and duration or length of program. The investigator will identify trends or factors that seem to enhance continuation and expansion of Precision Teaching as a viable way to monitor student learning and teacher and program effectiveness. Pitfalls that seem to result in discontinuance of the program will also be identified and listed.

Definition of Terms

These definitions are taken from the Journal of Precision Teaching, Summer, 1983, "Standard Glossary and Charting Conventions" section. Examples of the application of these terms to public education will be included in the definitions.

Frequency or performance- the number of movements per unit of time. Generally counted as the number of correct or error responses completed during a one minute sample of behavior.

Celeration or learning- change in frequency per unit of time. Generally calculated as the frequency of corrects or errors per week.

Acceleration- increase in frequency over time. Also called x (times) celeration.

Deceleration- decrease in frequency over time. Also called / (divide by) celeration.

Celeration Line- a best fit, straight line constructed through seven or more continuous frequencies of a given movement on the Standard Celeration Chart.

Learning Picture- the celeration lines of all movements being monitored. Generally includes the celeration lines for corrects and errors on a student's chart.

Standard Celeration Chart- a standard, six-cycle semi-logarithmic chart that measures frequency as movements / time and celeration as movements /time /time; Daily, Weekly,

Monthly, Yearly and Summary versions are available. The Daily chart is the most common version used in the classroom.

Precision Teaching is a monitoring system based on direct and daily assessment of student learning. Direct in that it measures the curriculum being taught by the classroom teacher. Daily in that it discourages the use of pre and post tests as a monitoring procedure and samples daily student progress toward specific objectives. It includes three dimensions of measurement; frequency, celeration, and bounce-variability within the celeration. These three dimensions are charted on the Standard Celeration Chart, developed by Ogden Lindsley and his students at the University of Kansas in 1967.

As applied in the classroom, Precision Teaching includes daily timed practice on an individual student's area of need or instruction. The performance is then charted on the Standard Celeration Chart. The charted points are used to make decisions about appropriate instructional interventions for any student's program.

Precision Teaching, however, can monitor not only student learning, but also teacher and program effectiveness. A teacher or program can be evaluated on the amount of learning accomplished by the individual student, the class as a whole, or the total program. The teacher has control over what is being taught and subsequently learned based on the student's entry level and daily instruction. The Standard

Celeration Chart is used to record data and monitor learning. In this way a valid, fair, objective system of assessment can be achieved, given any method of teaching used.

Student progress can be measured from the individual student's beginning point, rather than through the use of standardized achievement tests normed on what a small sample of students know at a given grade level. Thus, Precision Teaching eliminates the problem of a "one shot" performance score as a measure of student learning. Using growth measures rather than performance measures overcomes the problem of initial student differences in skill level. Individual progress and learning is the key, given any beginning level of skill.

Chapter 2

Review of the Literature

This review focuses on four research areas which bear on the current study. The first research area, that of school effectiveness, identifies characteristics of schools, principals, and teachers which are related to increased student achievement. The second research area, planned change in education, identifies factors enhancing successful planned change. The third area reviewed is federal aid to education through grants. The fourth area reviewed is Precision Teaching applications in public education.

School Effectiveness Literature

In most studies school effectiveness has been measured by improvements in scores on standardized tests of cognitive skills (Murname,1981). Up to the mid-1960's most of the evaluation studies looked at student test score gains. With the ESEA Act of 1965 focus shifted from students to projects, programs, and instructional materials (Nevo,1983). Across all of these studies key factors contributing to effective schools have been identified.

Effective schools have strong administrative leadership, a decisive principal who is actively involved in educating the pupils. Nine studies from 1971 to 1982 identified these as major factors contributing to effective

schools. The studies were conducted by Weber, 1971; Madden, 1976; Armor, et al., 1976; Austin, 1978; Edmonds,1979; Brookover and Lezotte, 1979; California State Department of Education, 1980; Glenn, 1981; and Cohen, 1982 (Sweeney,1982; Thomas, 1983; Purkey, 1983).

Leithwood and Montgomery (1982) among others, suggest that only 50% of elementary principals actually attempt to assist the teacher in improving instructional programs.

Wellisch and others, in 1978, in working with the Emergency School Aid Act (ESAA), identified four facets of instructional leadership found in effective schools, 1) concern for instruction, 2) communication with teachers about instruction (regularly reviewed and discussed), 3) participation in decisions concerning instruction, selection of materials, program planning and evaluation, and 4) coordination of instructional programs (Sweeney,1982).

Edmonds, in 1978, reported that effective leaders promoted an atmosphere of order, frequently monitored pupil progress, set clear goals and learning objectives for staff and pupils, and demonstrated strong leadership through a mix of management and instructional skills.

Brookover and Lezotte (1977) found leaders in effective schools to be more assertive, more effective disciplinarians, more inclined to assume responsibility and more apt to place an emphasis on instruction and student learning.

Leithwood and Montgomery (1982) identified effective

principals as those who: viewed themselves as instructional leaders; placed the achievement and happiness of students first; had clear short and long term goals for students centered on "the basics"; had a task orientation relationship with teachers; balanced instructional leadership, routine administration, and human relations; were prepared to sacrifice smooth interpersonal relationships for the sake of a more effective program; were concerned with the ready availability of adequate materials and resources in the classroom, and coordination of school curriculum; helped teachers manage their time more effectively; monitored student progress closely; and provided teachers with adequate planning time and feedback about classroom progress.

A second factor cited in the nine studies mentioned above emphasized achievement and high expectations for students by both teachers and administrators as contributing to effective schools (Sweeney, 1982; Thomas, 1983; Purkey and Smith, 1983).

Frequent monitoring of pupil progress was a key component of effective schools in the majority of the research reviewed by Sweeney (1982), Thomas (1983), and Purkey and Smith (1983).

A fourth factor contributing to effective schools as reported by Edmonds (1978), California State Department of Education (1980), and Levine and Stark (1981) was the clear setting of goals and objectives within the school.

Teacher effectiveness, a fifth contributing factor has been defined by Good (1979) as the ability of a classroom teacher to produce higher than predicted gains on standardized achievement tests. Recent studies have failed to show a relationship between how well teachers score on the NTE (National Teacher Examinations), other written tests of professional knowledge or intelligence tests, and gains in their pupil's achievement (Soar, Medley, and Coker, 1983).

A study by Jackson (1968) did show that teachers who structure, maintain, and monitor learning activities have an advantage in teaching basic skills.

Effective teachers were identified by Brookover, Schweitzer, Schneider, Beady, Flood and Wisebaker (1978) as those teachers who spent more time in instruction, "wrote off" fewer students as incapable of learning and provided praise that was contingent upon performance.

Joan Shoemaker of the Connecticut Department of Education summarized the effective schools research by stating that effective schools have:

1. Safe and orderly environments
2. Clear and focused school mission
3. Instructional leadership
4. Climate of high expectations
5. Opportunity to learn and student time on task
6. Frequent monitoring of student progress

7. Good home-school relations

(as reported by Lezotte, 1982).

Planned Change Literature

Leithwood and Montgomery (1982) define planned change as the realization of valued outcomes by students. It can be of two types; change that occurs within a given system leaving the system itself unchanged, e.g., a new program implemented in one classroom, or change whose occurrance changes the system itself, e.g., the whole building implementing a new program (Van Meter, 1980). Lezotte (1982) cautions that in designing a school improvement program the advocates need to recognize that improvement is a process, not an event, and may require three to five years to fully plan and implement.

Ten models or perspectives from which to view the process of planned change have been described by Van Meter (1982). These ten perspectives "...provide an orientation for viewing and interpreting change...strategies, on the other hand,...are procedures for getting something done" according to Van Meter. His ten perspectives are: 1) Critical and Radical Reform, 2) Legislated and Mandated Change, 3) Knowledge Production and Utilization, 4) Institutional Planning and Forecasting, 5) Conflict and Institutional Policy, 6) Consultation and Technical Assistance, 7) Organization Development and Renewal, 8) Training and Staff Development, 9) Individual and Self-Directed

Change, and 10) Behavioral Shaping and Influencing.

Mann (1978) found that only about 20% of the innovations or revisions in programs in education have been successful. In the final report of the Rand Study, a study which spanned several years, Berman and McLaughin (1978) reported that there was no class of existing educational treatments which consistently led to improved student outcomes. The successful projects had difficulty sustaining success over a number of years and successful projects were not disseminated easily or automatically. Replications of successful projects on a new site usually fell short of the performance at the original site.

St. John (1982) in researching effective planning, delegating and priority setting skills identified the following twelve causes of planning failure:

1. Lack of commitment by top level administrators
2. Inadequate commitment by implementing staff members
3. Wrong participants in initial planning and insufficient input of key information
4. Lack of administrative and staff understanding of the planning process, and its components
5. Expecting immediate, or too many results
6. Rigid adherence to the original plan despite changing conditions
7. Letting the plan become an end in itself
8. Planning too much too fast

9. Trying to implement without a sense of priorities and timing
10. Failure to see proper sequence of steps and the need to coordinate elements
11. Responsibility for implementing unclear or too restricted
12. Human tendency to do the easy, convenient, comfortable despite planning considerations.

What then are effective strategies for planned change? Sarason (1982) lists seven successful strategies; 1) mutual adaptation, 2) concrete specific and extended training, 3) classroom assistance from project or district staff, 4) teacher observations of the project in other classrooms, schools, or districts, 5) regular group meeting focusing on practical problems, 6) local materials development, and 7) participation by the principal in training.

Parish and Arends (1983) list four strategies for a successful adoption; 1) understanding of the culture of the school, 2) extended time for training and follow-up assistance, 3) two level site implementation plan (principal controls access and adoption and teachers control implementation), and 4) expect, encourage and assist with adaptations.

Studies of successful replications of NDN (National Diffusion Network) projects showed a need for and the importance of a local needs assessment, firm local commitment, and

in-service training for teachers and administrators (Neale et al., 1981).

Both the school effectiveness research (Armor,et al, 1976; Purkey and Smith, 1983) and the planned change research(Lezotte, 1982; Parish and Arends, 1983; Neale, et al. 1981; Sarason, 1982) stress the need for in-service training of teachers and administrators. Neale et al. (1981) and Sarason (1982) also state a need to involve the teachers in a decision-making role in all aspects of the program, from the needs assessment through implementation and evaluation.

Once training was complete Parish and Arends (1981) found that teachers felt that the new program would have to fit their style of teaching. Teacher autonomy decides the ultimate fate of a new program, with this decision being made outside the formal decision-making structure of the school. Teachers "...held to the view that a principal did not have the right to impose the specifics of a new program on them." Parish and Arends describe an informal covenant between the principal and the teachers. The principal speaks for the school concerning needs and negotiates, makes adoption decisions, arranges in-service and selects materials. The teachers support the principal's decisions, attend the in-service, but maintain the final authority about if and how new programs will be used in their classrooms and expect the principal to support the decisions they make and not interfere with instructional decisions. Principals were

identified as critical in the adoption phase, but not critical in the implementation phase.

Sarason (1982) describes the principal as an "educational spark plug" to energize others, acting as a change agent and collaborator. Purkey and Smith (1983) state that although it would be an advantage to have a forceful principal, leadership could come from a "critical mass" of teachers or a few influential teachers. A principal who gives active support to a new project gives the project legitimacy (Sarason, 1982). Leithwood and Montgomery (1982) state that the principal's role is to "facilitate necessary teacher growth and thereby indirectly influence student learning or impinge on other factors known to effect such learning."

Leithwood and Montogomery (1982) reviewed studies of the role of the elementary principal in school improvement (McGeown, 1980; Reinhardt, 1979; Venezky and Winfield, 1979) and found that effective principals disseminated their school's improvement projects to other schools and sold their innovative ideas to the superintendent to win financial support from central administration and the school board. Problems encountered by principals were lack of teacher motivation, failure of districts to provide adequate resources to support school improvement, central administrator's conservatism toward school initiatives, and a lack of visible support from central administrators.

Federal Aid to Education Literature

Over the past ten years (1973-1983), as shown in Figure 2.1, local revenues in education have been increasing by +30% every five years (x1.3), state revenues by +65% every five years (x1.65), and federal support through 1980 by +75% every five years (x1.75). Note that federal revenues jumped down in 1981 and have maintained at that frequency for the past three years (Education Week, May, 1984).

In the 1960's, federal support for education through the use of grants shifted from supporting states in efforts they had already undertaken to encouraging states to pursue national objectives (Berke, J.S. and Moore, M.T., 1982). The Elementary and Secondary Education Act (ESEA) of 1965 enlisted education in an effort to break the cycle of poverty. From 1965 to 1978, it developed categorical aid beginning first with Title I, a program for the economically and educationally disadvantaged student and then expanded to the areas of handicapped, bilingual, Indian, migrant worker, adult, basic skills, gifted and talented, and women's equity education.

Categorical aid not only targeted special groups of students, but also targeted curriculum areas such as career, environmental, consumer, and ethnic heritage education. In the beginning the acts passed by Congress were intentionally ambiguous to avoid conflict among the members of Congress. However, by the 1970's regulatory and statutory amendments were being adopted to eliminate this ambiguity and prohibit

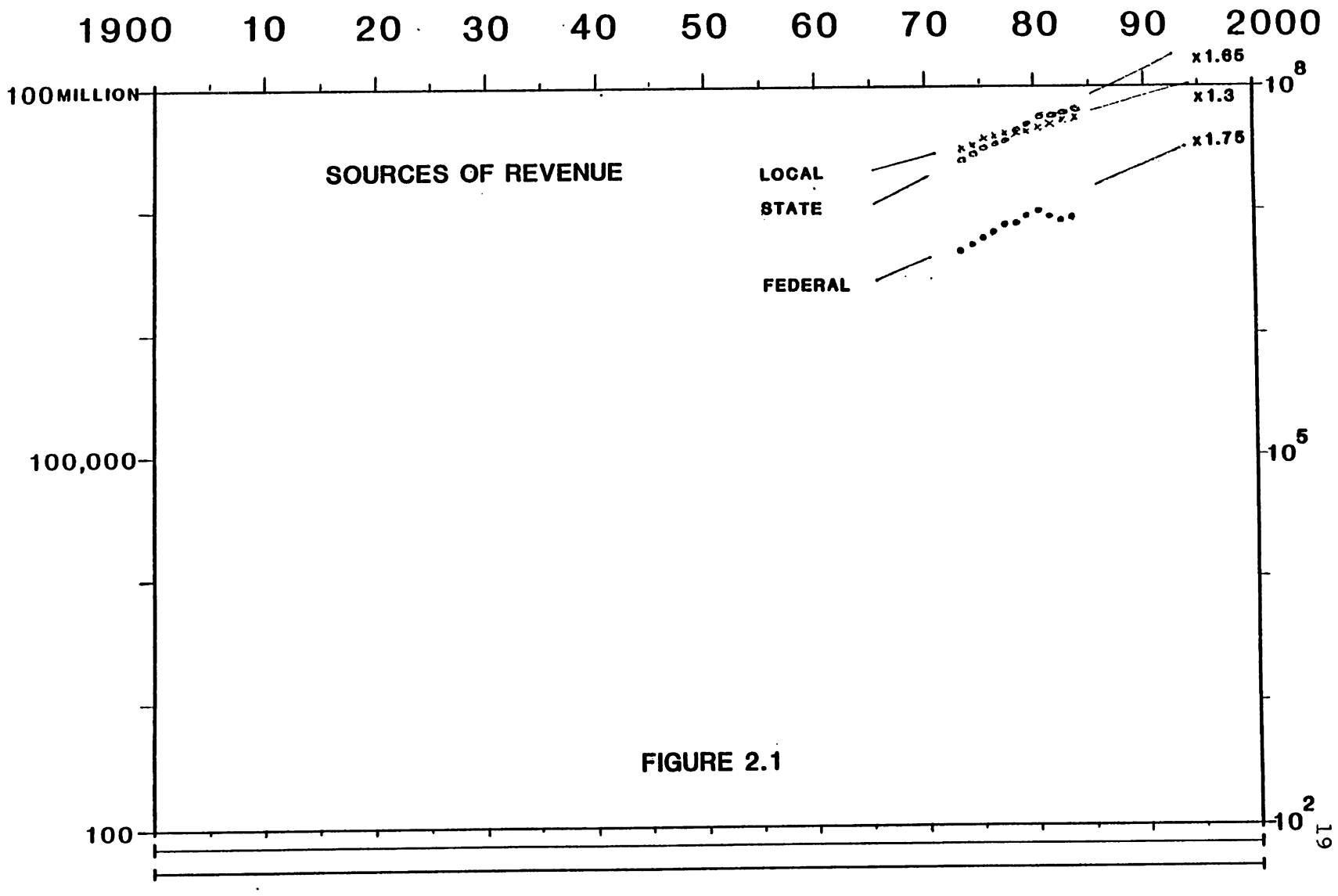
1900
10
20
30
40
50
60
70
80
90
2000
100 MILLION
100,000
100
10^8
10^5
10^2
x1.65
x1.3
x1.75
SOURCES OF REVENUE
LOCAL
STATE
FEDERAL

FIGURE 2.1

direct and indirect use of funds for general purposes. Grants began to include processing requirements, targeted populations, and in some cases requirements for matching funds from the local education agency.

In fiscal year 1982 the Education Consolidation and Improvement Act (ECIA) went into effect. The act consolidated most of the categorical programs into block grants awarded to each state. The intent was to cut the amount of governmental red tape that existed and make the grants available to all districts on an equal basis instead of being highly competitive. A study by Hastings (1983) of three states found that in two of the three, fewer than 1% of all districts participated in any federally funded programs in the year prior to consolidation. Even larger and more active grant-seeking districts rarely participated in more than four or five of the later consolidated programs.

One example of a federal attempt to disseminate exemplary programs is the National Diffusion Network (NDN). Beginning in 1974, its purpose was two-fold; to develop a system whereby schools could learn about exemplary programs, and secondly to enable schools to adopt these programs (Wickline, 1981). The Director of the National Diffusion Network Division of the Department of Education, Lee Wickline, describes its purpose now as "school improvement" and reports that 500,000 students annually are affected by its efforts. During the 1978-1979 school year more than

6,100 schools had adopted NDN projects. By September of 1980, 140 exemplary programs in 36 states were receiving NDN funds.

Neale, et al., (1981) in their book Strategies for School Improvement stated that the NDN "...illustrates a cost effective approach to in-service training ... [it] affirms the principles of the Partnership Model, in which the local school site is the focus for improvement."

The Rand report in 1978 found the net return of this federal investment to be 1) the adoption of many innovations, 2) successful implementation of a few, and 3) the long run continuation of still fewer (Sarason, 1982). Berman and McLaughlin went on to state that the success or failure of a school improvement project was dependent on how school districts implemented their projects, not on the type of federal sponsorship.

Parish and Arends (1983) studied five midwestern districts that had adopted NDN projects and later discontinued them. They found that the projects were adopted because of political pressure and that the administrators, either superintendent or building principal, had played a key role in selecting the project and coordinating training. They attributed the failures to three factors. First, the training was short and technical. Second, it provided specific skills needed for the program, and third, little effort was made to deal with local issues or circumstances

that call for adaptation.

Another factor, identified by the Rand study, that led to programs' discontinuance was the perpetuation of "special project" status of innovations. This status tended to leave the projects vulnerable to the financial and political fortunes of the district (Sarason, 1983).

Wickline (1981) said that both administrative and teacher support is necessary from the time a district starts to look for a new program. "Otherwise, an adoption may not be sustained for future years."

In summary, the Rand study found that the major effect of federal projects was to stimulate local education agencies to undertake projects consistent with federal categorical guidelines. Berke and Moore (1982) said, "In the long run, the most important effect of federal aid may be the attention to specific target groups and educational issues that it encourages."

Precision Teaching Literature

As defined by Lovitt (1977), teaching is the attempt to instruct someone in the doing or knowing of something by showing him how to do it or know it, while learning is indicated when a person has acquired a new behavior. The former can be measured by the clock, e.g., the number of hours of instruction, and the latter expressed as units in relation to time, e.g., number of words read per minute.

Murname (1981) suggests that children's progress should be used as the measure of school effectiveness instead of students' achievement level. Direct and daily measurement, major components of Precision Teaching, provide placement, communication, and evaluation information, furnish clues for remediation, and indicate correct and error rates. Conversely, achievement tests provide little assistance in remediation, indirect information, and grade level scores (Eaton and Lovitt, 1971).

Measurement provides teachers with information to determine 1) the effects of their teaching, 2) whether their pupils are developing, and 3) where their pupils are (Lovitt, 1977). Haring states in the preface to An Initial Training Sequence: Precision Teaching that "Progress in any field depends on continuous evaluation and modification of the methods being employed...Precision Teaching techniques offer a new system to increase the efficiency of both the teaching and the learning process."

Evelyn Johnson, a classroom teacher, described Precision Teaching as showing "...preciseness about the learning situation. It's a way to show students, parents and administrators that with proper effort, learning can take place" (Johnson, 1971). Martin (n.d.) describes Precision Teaching as a student centered approach in which "...child knows best in the sense that his performance is the one and only criterion for determining the effectiveness of any given

teaching plan."

Lindsley (1971), the acknowledged father of Precision Teaching, described it as "...any easy, inexpensive system of monitoring improvement - not performance..." The intent is "...to get the child doing more successful classroom work by making curricular changes which involve him in the learning process rather than trying to jack up a dull curriculum with rewards for doing boring tasks."

One minute samples of a student's performance are charted daily on the Standard Celeration Chart to monitor learning. Cortis (1919) found that a one minute sample of correct performance reflected skills a child had and how competent the child was in each skill. Short samples of many skills were found to provide more useful information than long samples of mixed skills (Wood et al., 1978).

Levels of proficiency for specific curricular objectives are set to provide students with an aim or goal. "Aims," as defined by Haughton (1971), "are the precise and specific objectives of an overall objective or goal." Wood et al. (1978) determined functional frequencies for math students in basic math skills by sampling students, successful and unsuccessful in high school math, and comparing their frequencies to an adult, community population.

One minute samples, aims, direct measures of the curriculum, decision making, and Standard Celeration Charting comprise the major components of the Precision Teaching model

(Beck, 1981). Martin (n.d.) described visual inspection of the chart as the primary analysis technique used by the teachers at the Experimental Education Unit at the University of Washington.

The SCC increases communication among educators by a x10 factor, ie. 2-3 minutes to share a project as compared to 20-30 minutes when the teachers made up their own charts (Lindsley, 1971). School effectiveness research (Good, 1979) suggests a need for instructional models that allow students to assume more control over their own instruction. All (1971) found that students actively involved in their own charts through naming and analyzing their learning pictures made better decisions about their own learning.

Beck (1981), in a follow-up study of Precision Teaching teachers in Montana and Washington, found two major reasons that teachers continued to chart; feedback to students and decision making. Eighty-two percent of the teachers responding in the survey perceived that Precision Teaching procedures had a much greater to somewhat greater effect on student achievement when compared to traditional practices.

Children can be taught to chart as early as age five (Bates, 1971) and first graders can peer tutor and teach other first graders to chart (Starlin, 1971).

Projects have been funded at the state and federal level to test the efficacy of Precision Teaching. The SST Project, 1971-75, funded by the State of Washington, developed a

classroom screening instrument, K-3, for learning disabled children based on Precision Teaching. In 1973, Montana, through a Title III innovative grant, funded the Great Falls Public Schools to develop a resource room model based on Precision Teaching. The project, through continued funding, expanded the model from special education to regular education, from elementary to secondary and then to a parent model (Beck, 1976, 1979, 1981, 1982).

A meta-analysis of the Great Falls Precision Teaching Project studies (Albrecht, 1984) yielded 85 effect size measurements with a mean of .45, a median of .43 and a range of 2.81 to -.68. Effect size measure the distance (in standard deviation units) away from the 50th percentile on the normal curve. An effect size (ES) of +1 means that the average person in the experimental group exceeds 84% of the persons in the control group. An ES of +.5 would be equal to the 67th percentile on the normal curve. The meta-analysis showed that Precision Teaching had a greater overall effect in regular education compared to special education and that it was more effective at the primary level compared to the intermediate or secondary level.

Initially used in the academic areas of arithmetic, reading and writing skills (Haring et al., 1978), Precision Teaching applications have been used in at least fifteen different areas in the public schools and two areas at the college level.

Duncan (1971), Calkin (1979, 1981) and Conser (1981) used Precision Teaching to measure inner behaviors. They found that 1) inner behavior can be studied and counted as objectively as outer behavior and 2) positive and negative thoughts and feelings are independent. Brown and Gibson (1982) and Gayler (1984) used Precision Teaching to monitor the use of the library and library skills. High School science curriculum (Miller and Calkin, 1980) was developed and measured using Precision Teaching. Creative writing skills (Albrecht, 1981) were measured and increased through the use of Precision Teaching. Speech therapy has used Precision Teaching in the areas of articulation (Thomasen, 1981) and articulation, stuttering, and voice therapy (Johnson, 1971). The charting of discipline problems, deviant behavior, and behavior goals to analyze and monitor changes in behavior was found effective by Lessard (1979), Mahan et al. (n.d.), Johnson (1971), and Flanagan (1983). Duncan (1971) used the chart to measure the learning of gifted students both academically and with personal management targets. Peterson and Holman (1984) used Precision Teaching to measure a group activity with learning disabled students in the language skill of recalling facts.

The chart has been used to monitor teacher training programs and students in the field (Wolking and Gerent, 1984 and Caldwell, 1971). As a technique for learning facts for a college class, Precision Teaching has been used by a variety

of college instructors, (Eaton and Fox, 1983; McDade et al., 1983; Merbitz and Olander, 1980; Bower and Orgel, 1981; Graf, 1978; and Lindsley, 1978). The chart has also been used to monitor administrative behavior (Berquam, 1983), building supervision and change (Flanagan, 1982) and program maintenance (Kunzelmann, 1971).

References to Precision Teaching from 1965-1971 grew at x14 every five years, from 1971-1978 references decelerated by a /1.7, and then accelerated at a x12 from 1978-1982 (Eshleman, 1984). These data reflect presentations at the Applied Behavior Analysis Conferences (ABA), articles in the Journal of Precision Teaching, and the Precision Teaching Winter Conferences. A review of special education textbook references to Precision Teaching show a x3.0 overall celeration every five years from 1970-1981 and a most recent celeration, 1974-81, of x1.4 every five years (Fox, 1982).

At the Experimental Education Unit, located at the University of Washington, implications of Precision Teaching application provide: 1) teachers a way to evaluate and discover the most productive methods or styles of teaching, 2) identification of key ingredients of the teaching plan, 3) teachers with an opportunity to use the classroom as a laboratory (Martin, n.d.). The Experimental Education Unit uses Precision Teaching techniques and the Standard Celeration Chart on a daily basis with university students in a practicum situation, for research purposes, and to monitor the progres

of the children placed in the program.

"Precision Teaching simply adds a more precise measurement instrument to present teaching, making teaching more economical, more effective, more enjoyable, and more loving."(Lindsley, 1971).

Chapter 3

Design and Procedure

Selection of Subjects

This study examines ten representative programs which have implemented Precision Teaching since 1970, including:

1.) two districts which, after validating its efficacy within their own districts, have become part of the National Diffusion Network's dissemination program. They are the Minneapolis School District (SIMS) and the Great Falls School District (Precision Teaching Project).

2.) a regional service unit serving twelve different school districts in Minnesota, Bemidji Regional Interdistrict Council

3.) a county school district serving a large urban population, Orange County School District of Orlando, Florida

4.) a school district trained by the Precision Teaching Project of Great Falls, Weber County School District of Ogden, Utah

5.) a private school, Father Flanagan's Boys Town of Boys Town, Nebraska.

All of these programs are still in existence.

The study examines four programs which are no longer in existence:

1.) a multi-district program, the Seattle, Spokane, Tacoma Project (SST) from the state of Washington

2.) a county school district in Ontario, Canada serving school districts in Hastings County

3.) an urban district project, Project Product of Shawnee Mission School District in suburban Johnson County, Kansas

4.) a private school, Spaulding Youth Center in Tilton, New Hampshire

Table 3.1

School Districts and Programs Included in Study

Project	Date		Funding Source*		Student Population	
Name	Begin	End	Begin	Current	Begin	Current
Bemidji	1970	----	L	L	SE	SE, R
SST	1971	1975	F	------	SE	------
Hastings Co.	1972	1981	L	------	SE, R	------
SIMS	1972	----	L	L, F	SE	SE, R
Great Falls	1973	----	S	L, F	SE	SE, R
Spaulding	1974	1981	L	------	SE	------
Proj.Product	1975	1978	S	------	R	------
Weber Co.	1977	----	S	L, S	R	SE, R
Boys Town	1979	----	L	L	R	R
Orange Co.	1980	----	S	S	SE	SE, R

*L=local, S=state, F=federal, SE=special, R=regular

Table 3.1 lists the districts included in the study, their original funding source, beginning and ending date, and the student population served in the beginning of the program and currently.

These ten programs are a representative sample of Precision Teaching Programs nationally and internationally. Eight of the ten programs were selected because of their uniqueness, selecting both active and inactive programs. Two of the programs represent the current trend of implementation. Inclusion in the study depended upon availability and completeness of the data.

The five earlier programs; Bemidji, SST, SIMS, Great Falls, and Hastings County have had major impact on the field of Precision Teaching with nationally known experts in the field coming from these programs. They have expanded the knowledge base and provided training and observation sites for later programs.

The two privately funded school programs, Spaulding Youth Center and Boys Town, were selected because they mandated Precision Teaching and Standard Celeration Charting.

Project Product represented a different approach to implementation, the resource room model.

Two of the latest programs, Weber County and Orange County represent the current trend, districts implementing a previously proven program.

Data Collection and Instrumentation

The primary source of data was a telephone survey interviewing the project directors or administrators responsible for the program. For projects no longer in existence, the original project director and/or other personnel involved with the project were interviewed. The survey, was administered by the author to ensure consistency both in the way the questions were asked and answers were interpreted.

In eight of the ten programs, the original program director was interviewed. A median of two people per project were interviewed. (See page 104 Personal Comunications). In some cases the person interviewed could not answer all of the questions, and additional people were interviewed until all of the information was collected. A total of twenty people were interviewed and the interviews generally required two or three phone calls per person to gather all of information. Two of the interviews were done on site, SIMS and Orange County, although additional phone calls were made to complete the questionnaire.

The questionnaire was designed to include variables which might determine the success of implementation of Precision Teaching within a district. It was field tested with three of the programs and redesigned based on their input as well as a review of the related literature in the field of planned change and school effectiveness. The

completeness of the information received and recorded was judged by a final open ended question asking the interviewees whether they had any other pertinent information to add that was not covered in the interview. The first three project directors interviewed provided input resulting in the revision of the survey. However, by the final version (revision number four) the respondents replied that the survey covered all of the important information concerning the district's implementation of Precision Teaching. A copy of the questionnaire (Form PTFUQ) used for the telephone interview is included in Appendix A, page 108.

The second source of data was reports from the programs written to comply with local, state and federal funding. Reporting requirements were analyzed and compared to the data collected in the interview to validate the information collected and provide additional background information.

The third source was a second questionnaire (Form PTIQ) which was developed during the study to collect data on the present implementation of Precision Teaching within the districts. The questionnaire was mailed to projects currently active to be completed by the school districts. This questionnaire is also included in Appendix A, page 106.

The questionnaires covered the following areas; 1) funding source, 2) original interest in Precision Teaching (person), 3) person responsible for the program, 4) director changes, 5) level of support for the program within the

district, 6) duration of the program, 7) number of schools, 8) teachers, 9) students using Precision Teaching, 10) population, 11) grade levels, 12) curriculum areas using Precision Teaching, 13) number of students charting, 14) number of charts per student, 15) average celerations, and 16) number of lines in the learning pictures.

Data Analysis and Interpretation

The study is quantitative. The results of the questionnaires were charted on the Standard Celeration Chart either as frequency distributions, as celerations on a Yearly Chart, or listed in summary tables.

A frequency distribution compares cost per teacher per year during the first year of implementation to the cost per teacher per year presently.

Districts currently using Precision Teaching are charted on a Yearly chart showing number of teachers involved from the initial date of implementation to the present. Celerations are calculated for funds allocated, teacher use, and cost per teacher per year. The ratios of schools, teachers, and students in the district to those using Precision Teaching are also displayed on the Standard Celeration Chart.

Standard Celeration Chart

The Standard Celeration Chart (SCC) is used since it displays proportional rates of change, i.e., it permits

comparing small numbers with large numbers without distortion. The SCC transforms frequencies into their logarithms allowing the observer to see the resultant relationships; linearity, symmetry, and additivity (Koenig, 1972).

Semi-logarithmic charts have been used for many years, but they were without standardization, making comparisons difficult to accomplish. Lindsley (1967) standardized the charts so that a constant amount of growth or celeration is represented by the same angle on all of the charts; Daily, Weekly, Monthly, and Yearly. For example, a doubling effect or a x2 growth weekly, monthly, every six months, or every five years is a 33 1/3 degree angle on all charts. A x2 celeration can be seen by drawing a diagonal line from the lower left hand corner to the upper right hand corner of any chart.

A protractor, with its angles calibrated in standard celeration values, can be used to geometrically measure the growth or celeration of any charted course. It can also be used to measure proportional frequency changes, jumps up or down, by using the multiply or log scale as a geometric measuring device.

Selection Limitations

The study did not sample all districts which have implemented Precision Teaching and Standard Celeration Charting. Numerous studies have been conducted testing the

efficacy of the procedure and the use of Precision Teaching is growing exponentially across school districts with over one million dollars already spent on Precision Teaching training and implementation. Yet there has been no systematic summary or follow up of prior implementations. This study is the first study to review Precision Teaching implementation within and across districts over time and to compare follow-up reviews.

The study reviewed ten major programs, selecting projects of representative sizes, durations, and funding amounts. The programs reviewed had different reasons for the initial introduction of Precision Teaching, and they implemented Precision Teaching in different ways. It is hoped that the reader will replicate the data collection method and make similar comparisons within his or her own district to determine whether similar trends have occurred.

Chapter 4

Histories of Ten School Systems' Implementation of Precision Teaching

The ten researched projects had different reasons for initiating Precision Teaching; yet, the final goal was the same; to increase student learning through daily monitoring of student progress.

1) Bemidji Regional Interdistrict Cooperative included Precision Teaching and the Standard Celeration Chart as the data management component in its original design.

2) SST project of Washington validated a screening procedure for identifying students with learning deficits and provided subsequent remediation.

3) Hastings County School District of Ontario, Canada monitored student learning with daily timings and charts and collected monthly data to check student progress across a variety of curriculum areas.

4) SIMS project of Minneapolis designed a specific language curriculum to use with children with severe learning disabilities in a self-contained situation and used the Standard Celeration Chart as the monitoring and decision making device.

5) Great Falls project developed a resource room model for delivery of educational services to children with learning deficits, the mildly handicapped.

6) Spaulding Youth Center, a private residential school for learning disabiled and autistic children, used Precision Teaching both in the classroom and the residence to monitor academic and social skills progress.

7) Project Product of Shawnee Mission School District developed a resource teacher model, designed to provide regular classroom teachers with assistance in setting up data based programs for their classrooms.

8) Weber County School District of Ogden, Utah implemented Precision Teaching to turn around the declining test score trend in the district and emphasize basic skills.

9) Father Flanagan's Boys Town implemented Precision Teaching and data based management as a part of a package including a social skills program, a tutoring program, Precision Teaching, and individualized instruction.

10) Orange County School District of Orlando, Florida implemented Precision Teaching to provide a data based management system and a curriculum for their mildly handicapped students.

Bemidji Regional Interdistrict Council

In 1970, the Bemidji Regional Interdistrict Cooperative was formed to serve special education needs in fifteen school districts in northern Minnesota. A faculty member from Bemidji State University with a background in Precision Teaching served as a consultant to the cooperative in the

planning stages. He was then hired as Supervisor of Programs. The Supervisor of the Learning Disabilities program was also an experienced Precision Teacher.

The Supervisor of Programs and the Learning Disabilities Supervisor brought with them the Standard Celeration Chart as a monitoring device and Precision Teaching techniques as instructional tools for special education teachers to use in their classrooms. Part of their administrative responsibility was to provide Precision Teaching training to the special education teachers in the cooperative. This was accomplished through a formal in-service program and bi-monthly meetings with the teachers.

In 1975 Bemidji School District withdrew from the cooperative and over the next two years two more districts withdrew. The effect of their departure caused a frequency jump down in the number of teachers using Precision Teaching, resulting in an overall deceleration of /1.25 every five years. See Figure 4.1.

In 1977 the original Program Supervisor and the Learning Disabilites Supervisor left the cooperative. The new Learning Disabilites Coordinator was familiar with Precision Teaching and with her support the Cooperative continued to use the Standard Celeration Chart as an integral part of its program.

As seen in Figure 4.1, the overall celeration is /1.25 every five years. However, the most recent celeration, 1975

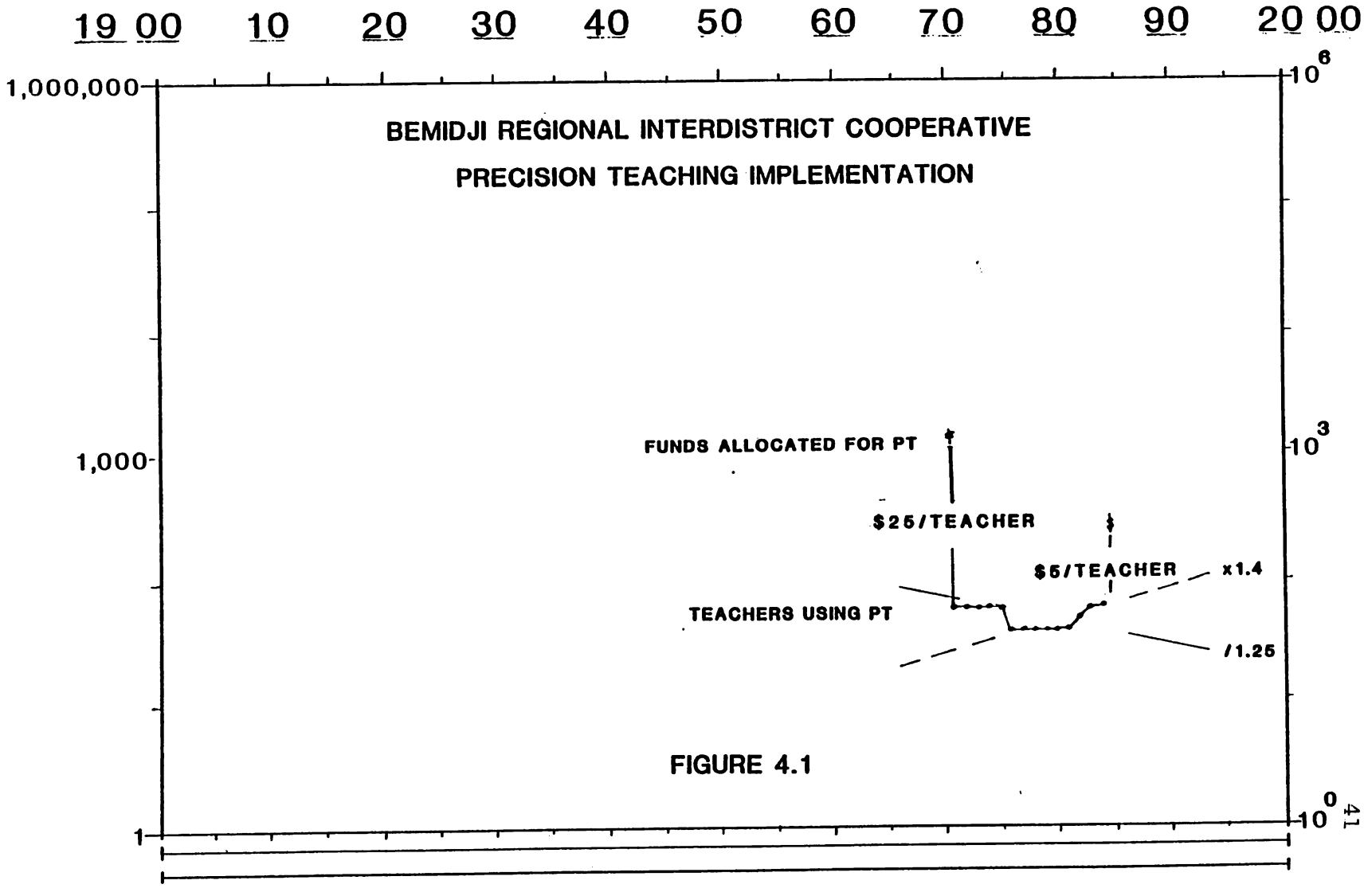
19 00
10
20
30
40
50
60
70
80
90
20 00
1,000,000
10^6
BEMIDJI REGIONAL INTERDISTRICT COOPERATIVE
PRECISION TEACHING IMPLEMENTATION
1,000
10^3
FUNDS ALLOCATED FOR PT
$25/TEACHER
$5/TEACHER
x1.4
TEACHERS USING PT
/1.25
1
10^0

FIGURE 4.1

to 1984 is x1.4. The small frequency jump up in 1981 is attributed to SIMS training, a Precision Teaching model, provided to the teachers of the mildly handicapped. All of the teachers of the mildly handicapped are currently using Precision Teaching and it is also beginning to be used in the regular classrooms.

Standardized test data are collected for individual students, but regrettably no comparisons of students using Precision Teaching with those not using the procedure have been made.

Funding of Precision Teaching activities is built into the Cooperative's general fund budget. This in-house support is seen by the original program directors and the present coordinator as the major reason for the continued success of the program. It is an integral part of the program, not a separate project. The funds allocated for Precision Teaching have decreased by a factor of /5 from 1970 to 1984.

The cost per teacher using Precision Teaching was $25 per teacher in 1970 and decreased to $5 per teacher in 1984. (See Figure 4.1, p.41).

Seattle, Spokane, Tacoma (SST)

In 1971 the State of Washington through a BEH P.L.91-230 Part G grant funded the SST Project as part of its Child Service Demonstration Centers. The goal of the project, entitled PERFORM - Precise Educational Remediation FOR

Managers of Specific Learning Disabilities Programs, was to find and remediate children with developing learning disabilities before the disabilities became so intense that child had to be removed from the regular class. The funding level of the project for each of the three years of existence was $70,000.

The process included a screening procedure that incorporated a measure of both performance and learning, a Precision Teaching model.

Over a three year period, 11,053 children were screened, 1,843 or 17% were initially identified, 1,932 children were included in remediation, and 1,402 children were successfully remediated (Willis, 1974). The screening procedure identified three types of students in need of remediation; those whose performances ranged from high to low across the skills assessed, those whose performances were most or all below the class median and not improving with practice, and a third group whose charted performances showed variability across all or almost all skills assessed.

The first group was described as possibily having a form of learning disability, the second as slow learners, and the third group as disturbed and/or disturbing to the regular classroom teacher.

Following screening, remediation programs were set up for the identified students. These programs included one minute drill or practice sheets developed by the SST staff

and charting progress on the Standard Celeration Chart. Over 3,000 practice sheets were developed by the SST staff and disseminated to interested teachers and districts. The practice sheets covered the basic skill areas of reading, math, and penmanship for grades K-3.

Over the three year funding period, the most frequently used skills in the areas of math and reading were identified, median frequencies determined, and suggested grade level aims were set. The project found that 29% of the students screened and identified as having basic skill deficits could be brought up to the class median in one or more skills with 10 days of further practice, and 4% to 7% required extensive remediation.

No arrangements were made to continue the program at the local level at the completion of the funding period. The original projector director left and the lead teachers in each of the three districts continued the use of Precision Teaching within their districts to varying degrees.

In Tacoma in 1974, the supervisors were instructed to "soft pedal" the method because of problems developing between the Special Education Department and the Curriculum and Instruction Department. It had been presented as an "end all" and isolated from the curriculum. The greatest criticism voiced by the teachers was that no one came back to share the data; this implied a lack of understanding of the Standard Celeration Chart.

Precision Teaching is currently being used on a very informal basis. It is more likely that teachers are using the materials and doing timings, but not charting. In 1974 it was being used in 43 elementary schools by about 60 teachers, and current estimates are that 15 teachers are still using the techniques and the Standard Celeration Chart. However, one of the program administrators, responsible for eleven schools, plans to implement the use of the chart next year to monitor student learning. She is designing a consultant model to use with resource teachers which encourages the use of the Standard Celeration Chart and Precision Teaching paired with the Direct Instruction Model from the University of Oregon.

In Spokane in 1974, the use of Precision Teaching continued as the result of the support of one of the original project staff. She was the Special Education Coordinator for Learning Disabilities and in that position could encourage its use with her teachers. During the period from 1974, the end of the SST project formally, to 1981, her retirement, the number of teachers using Precision Teaching increased from 15 teachers in 14 schools to 38 teachers in 40 schools. Fourteen new schools built during that time had the resource room designed specifically for Precision Teaching activities.

The Supervisor of Special Education and the Assistant Superintendent were very supportive of the procedure. However, when they both retired in 1981, a new Supervisor was

hired who was not data based and did not support the use of Precision Teaching to monitor student progress. The Learning Disabilities Coordinator left the district in 1981 partially because of this difference in philosophy. Use of Precision Teaching by teachers decreased to its current level of 12 special education teachers.

In Seattle in 1974, at the end of the project there were poor feelings about Precision Teaching and the screening process. It had not been implemented well and there was no staff support. In 1980 the Special Education Department negotiated an agreement with the teachers's union, a broad statement requiring the collection of data on students. This will open the door for Precision Teaching as one option in that data collection system. Currently, only 1 or 2 teachers out of 350 total special education teachers use Precision Teaching and they only to a limited degree.

Hastings County School District

In 1972 the Hastings County School District of Ontario, Canada hired a consultant to train teachers in Precision Teaching. The consultant was subsequently hired as a school psychologist for the district and provided Precision Teaching training to regular and special education teachers.

The major effort continued until he left the district in 1981. Local money provided support for training and materials. Precision Teaching was used in two ways; daily

and monthly as a check on student progress. By 1980 Precision Teaching was used daily in 15 of the 30 schools (K-6) by 350 teachers with 6000 students and in 25 schools as monthly progress checks. Currently 25 teachers are using Precision Teaching with approximately 625 students a decrease in number by a factor of /14 in teachers and /18 in students.

During its popularity, Precision Teaching was being used by regular and special education teachers in twelve curriculum areas, K-6 and 9-11. Encouraging high frequencies, monthly assessment of curriculum, and development of screening materials for use at specific grade levels in a variety of curriculum areas were emphasized by the teachers of Hastings County.

The administrative organization of the district is different from the traditional United States organization. The top administrator is the Director of Education with area Superintendents below that position. From 1972 to 1980 the Director of Education and the area Superintendent in Belleville, Ontario strongly supported Precision Teaching efforts. However, Precision Teaching was resisted at the county level. The county administrators felt their authority was being usurped by this monitoring procedure.

In 1980 both the Director of Education and the supportive Superintendent left the district. Within a year Precision Teaching began to decline. Two district personnel

were fired because of their association with and support of Precision Teaching.

The residual use of Precision Teaching (25 teachers) continues because of teacher commitment, often contrary to administrative philosophy. The administrators sensitive to its usefulness remain moderately supportive and help those teachers using it. However, there is no effort to provide training for other teachers who might want to use Precision Teaching in their classrooms.

Minneapolis (SIMS)

In 1972 the Minneapolis School district began a program to serve learning disabled students requiring a more restrictive self-contained setting. The goal was to develop a site and procedures for this group of students. The district provided $250 for materials and supplies and provided two classrooms to serve 14 students. It became a school within a school, serving the total district.

The project staff found that reading inability underlay all of these students' problems. The staff focused on developing a reading curriculum, strategies to increase reading skills and used the Standard Celeration Chart to monitor growth and make decisions. The goal was to return as many of the students as possible to the least restrictive setting within two years of initial placement.

During the first year, both equal interval graphs and

the Standard Celeration Chart (SCC) were used. However, the project switched completely to the SCC in 1973 because it clearly showed results to students and parents and was easier to interpret.

From 1972 through 1974, the project was totally supported at the local level and was called the Armitage-Franklin Learning Center. The district copyrighted the reading curriculum, including the instructional materials, strategies, and the decision making procedures.

In 1975, the district applied for and received a BEH Title VI-G Child Service Demonstration Center grant. This gave the district an opportunity to validate the curriculum and strategies in ten districts with 100 teachers in the greater Minneapolis area. In addition to the reading curriculum and strategies, they also piloted a social work and occupational therapy program. The total funding through the BEH grant was $284,393. At the state and local level they received $145,391 and $409,940 respectively over the same three year period from 1975 through 1978.

In 1980, the project was validated at the federal level by the Joint Dissemination and Review Panel (JDRP) as SIMS, Systematic Instructional Management Strategies, and became a member of the National Diffusion Network as a developer/ demonstrator project from 1980 through 1984.

The project has been an integral part of the Minneapolis School District since 1972. Figure 4.2 shows teacher use of

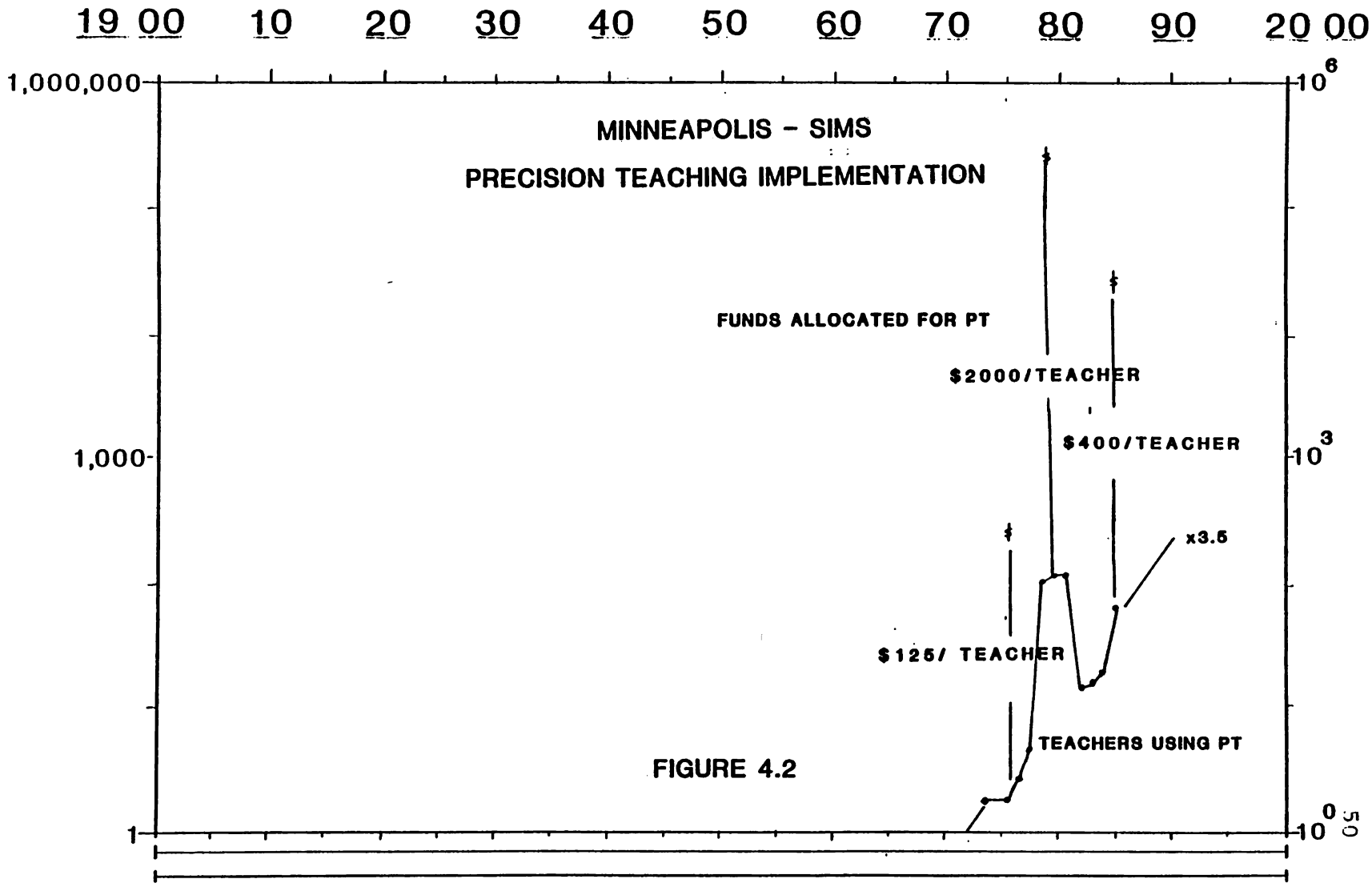
19 00
10
20
30
40
50
60
70
80
90
20 00
1,000,000
1,000
1
10^6
10^3
10^0
MINNEAPOLIS - SIMS
PRECISION TEACHING IMPLEMENTATION
FUNDS ALLOCATED FOR PT
$2000/TEACHER
$400/TEACHER
$125/ TEACHER
x3.5
TEACHERS USING PT
.05

FIGURE 4.2

Precision Teaching celerating at x3.5 every five years, with an additional frequency jump up of x3.5 from 1983 to 1984. This jump up can be attributed to the district's development of benchmark (minimum competency) requirements in math and reading.

The ratio of total teachers in the district to teachers using Precision Teaching is 50 to 1. Use of Precision Teaching has expanded from the SIMS project to other special education programs and also to regular education.

The funding for the project multiplied by a factor of X100 from 1970 to 1975 during the period of validation and the change factor from 1975 to the present shows a funding decrease of /10.

In 1972 the cost per teacher using Precision Teaching was $125 per teacher per year. During the validation phase it increased to $2000 per teacher and then decreased to $400 per teacher in 1984. See Figure 4.2.

Great Falls Precision Teaching Project

In 1973, the Great Falls Public Schools applied for and received an ESEA Title III innovative grant from the Office of Public Instruction, State of Montana. The project was entitled Educational Remediation for Children with Learning Deficits Through Precision Teaching.

The goal of the project was to develop a model for the delivery of educational services to children with learning

deficits. The major components of the model were: 1) staff training, 2) screening and identification of students, 3) remedial instruction, 4) measurement and evaluation, and 5) dissemination of the validated model.

The funding level for the first year, 1973-74 was $70,522. The continuation grants for 1974-75 and 1975-76 totaled $88,669 and $78,824 respectively.

Six elementary schools grades K-3 were included in the study, three experimental and three control. Socio-economic status was controlled for with one school in each group fitting into each of three categories; 5% low income families, 12% low income families, and 20% low income families. Students were pretested in October, 1973, using a ten day Precision Teaching screening procedure modeled after the SST project. Those students in the experimental schools falling in the lower quartile of their class were identified and placed in the Precision Teaching Resource class for an average of 30 minutes per day for an average of 20 weeks (Beck, 1975).

The students in the control schools were screened with the same method, but the results were not released until the following May to ensure that the students would not be identified and treated differently from their classmates.

The project, in addition to finding statistically significant differences in favor of the experimental group, reported the following educationally important facts; 1) the

magnitude of the effects was large, i.e., the post test means of the experimental group exceeded the post test means of the control groups by more than 1/3 of a standard deviation, 2) the procedure was most effective in first grade, 3) the procedure was not affected by socio-economic status, and 4) its continued use would be inexpensive.

The data were submitted to the Joint Dissemination and Review Panel (JDRP) of the U.S. Office of Education in 1976 and were validated by the panel. The project was included in the Office of Education's publication entitled Educational Programs That Work, and became eligible to apply for funding through the National Diffusion Network (NDN) as a developer/demonstrator project.

The project has been funded continuously from July 1976 through July 1988 by the NDN. The project also received state dissemination funds (ESEA Title IV-C) from 1976 through 1980 to disseminate the project in Montana. Figure 4.3 shows the levels of funding at the local, state, federal level. State support was decelerating by /1.4 every five years until its end in 1980. Federal funding is decelerating by /1.1 every five years. Local support is doubling x2 every five years.

In 1979, the Great Falls Precision Teaching Project submitted regular education data to the JDRP and received validation in regular education also.

Broadening their base, the Great Falls Project tested

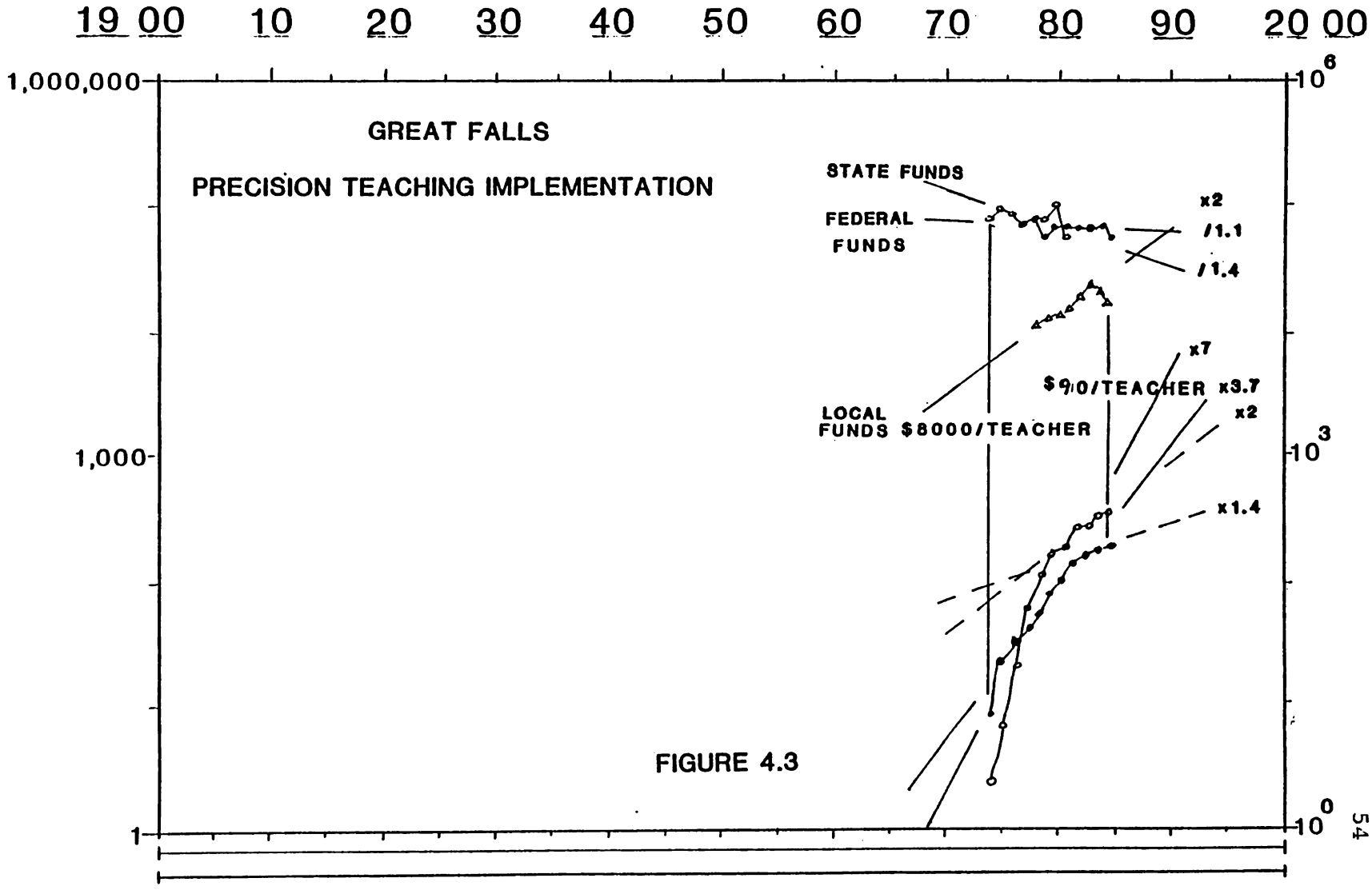
19 00
10
20
30
40
50
60
70
80
90
20 00
1,000,000
1,000
1
10^6
10^3
10^0
GREAT FALLS
PRECISION TEACHING IMPLEMENTATION
STATE FUNDS
FEDERAL FUNDS
x2
/1.1
/1.4
LOCAL FUNDS
$8000/TEACHER
$900/TEACHER
x7
x3.7
x2
x1.4

FIGURE 4.3

the efficacy of Precision Teaching at the high school level in the area of Basic Skills (math and English). They also studied the individual components of Precision Teaching; timed practice, daily charting, and decision making from the chart to determine which components or combination of components are responsible for the greatest student improvement.

Both projects showed favorable results thus extending and proving the efficacy of Precision Teaching as a valid procedure to monitor student learning in the curriculum. These two projects were validated at the state level by the ESEA Title IV-C validation team, who recommended that the projects be presented at the federal level (JDRP) for national validation.

The district currently funds .5 FTE as a trainer for the school district, one clerical person half time to manage the Materials Bank of over 10,000 practice sheets, and a program manager half time to coordinate the design of materials for use by district teachers. The district also pays the cost of substitutes when teachers are trained by the project.

Using Precision Teaching daily to monitor progress toward IEP goals is mandated in the Special Education Department. In regular education, using Precision Teaching is voluntary and at the discretion of the the individual teacher. Materials necessary for implementation are purchased through the individual school supply budgets.

As shown in Figure 4.3, teacher use of Precision Teaching has an overall celeration of x3.7 every five years since its first application in special education in 1973. The most recent celeration is x1.4 every five years, a celeration turn down of /2.6. The training of teachers in the district shows a celeration of x7 every five years overall and x2 every five years most recently, a celeration turn down of /3.5. The turn down is determined by dividing the larger celeration by the smaller celeration and using the direction of the turn as the sign (x or /).

The proportion of teachers using Precision Teaching as compared to total teachers trained in Precision Teaching in the district is 2:1, two trained for every one using it. The ratio of teachers in the district is 60:1, sixty teachers in the district for every teacher using one teacher using Precision Teaching and 30:1 for every teacher trained. It is used in 16 of the 22 schools in the district across all grade levels.

The cost per teacher using Precision Teaching was $8000 per teacher in 1974 and decreased to $90 per teacher in 1984. See Figure 4.3.

Spaulding Youth Center

In 1974 Spaulding Youth Center, a private residential school for autistic and severely learning disabled students, hired a new Director of Schools, a new building principal,

and a new residential programs director. The program was redesigned with the Standard Celeration Chart used for data analysis. All 180 students were monitored over 24-hours and their behavior frequencies charted on the Standard Celeration Chart. An average of ten daily charts were kept on each student.

The teaching staff, which included both classroom and residential members, increased from 60 in 1974 to 90 in 1981. The turnover rate was about 30 per year which required training of 1/2 to 1/3 of the staff each year.

Judgments of the success of the project were not determined by standardized test comparisons because of the severe learning problems of the students. From 1974 to 1981, when the Director of the school resigned, the program was considered enormously successful by the school staff.

Within months of the Director's leaving both the Principal and Residential Program Director also left. The Board of Trustees replaced the School Director with a Director whose philosophy differed greatly from that of the original Director. The program's focus changed radically within a few months and there was a "total house cleaning" of staff. The school currently has an entirely different reputation and focus.

The former director described the problem as two-fold; first the Board of Trustees did not have an adequate understanding of the program, and second the program

maintained because of the commitment of the administration alone; when they left the program ceased to exist.

Had the Board of Trustees understood and supported the program, they could have selected a new Director with a background in Precision Teaching, since there were two applicants with this experience.

A contact with present staff revealed that although some of the faculty are still doing daily timings, the Standard Celeration Chart is not being used to monitor progress or to make decisions.

Shawnee Mission - Project Product

Funded through a Title IV-C innovative grant, 1975-1978, Project Product provided Precision Teaching training to classsroom teachers in the Shawnee Mission School District. The goal was to provide "curriculum materials, learning activities, teaching skills, and other educational tools to help foster in each student a clear improvement that he or she can see and measure"(Sokolove, 1978). The model was a resource service which involved a Project Director and four resource teachers who met weekly with classroom teachers.

Standardized test comparisons made in one curriculum area indicated significant pretest-posttest differences ($p=<.01$) for the experimental group using Precision Teaching as compared to the control group, no Precision Teaching.

During the three years of existence, the project trained

161 teachers in 27 elementary schools, five junior high schools, four high schools, and five parochial schools. Seventy to seventy-five teachers per year used Precision Teaching with an average turnover rate of 10% per year. By the final year 1977-78, 1,400 students were using Precision Teaching in eight different curriculum areas. See Figure 4.4

The costs per teacher using Precision Teaching went from $1300 to $1200 per teacher in the three years. By contrast, in its third year the Great Falls project was at $2000 per teacher using Precision Teaching (See Figure 4.3). The costs per student using decreased from $100 to $60 per student in the three years of Project Product.

Total funding for the three years was through the Title IV-C grant, no local commitment was made financially. At the end of the grant period, there were no arrangements made to continue the program. The Project Director and the resource teachers either left the district or returned to classroom positions.

According to current administrative personnel, the project "slowly died out." There was no formal district continuance and while there may be a handful of teachers still using it, they have no way of knowing how many and in which schools.

All of the materials were discarded and the remaining copies of the final product, a guide designed for using chart based learning to structure teaching, Blueprint for

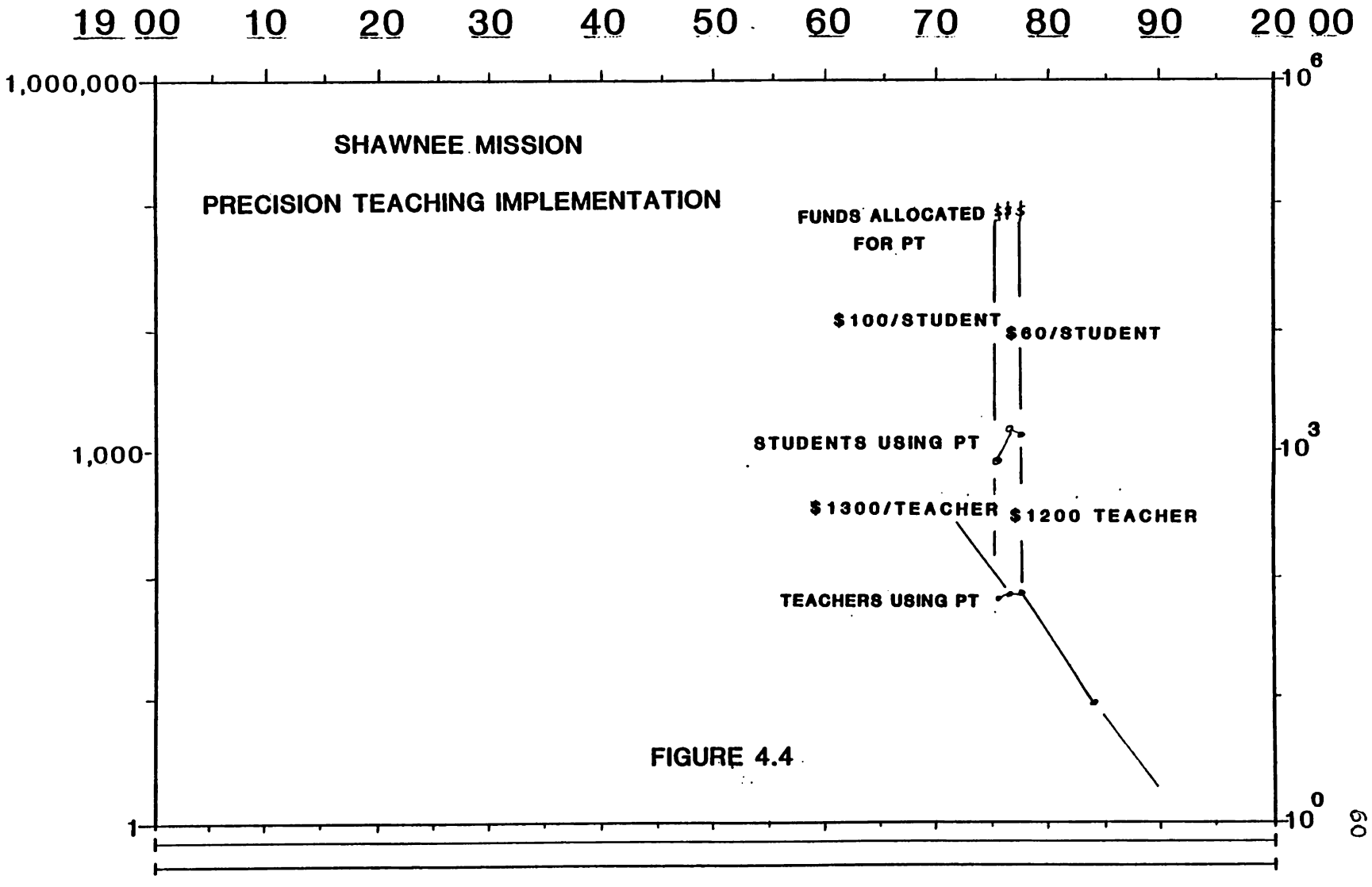
19 00
10
20
30
40
50
60
70
80
90
20 00
1,000,000
1,000
1
10^6
10^3
10^0
SHAWNEE MISSION
PRECISION TEACHING IMPLEMENTATION
FUNDS ALLOCATED FOR PT
$100/STUDENT
$60/STUDENT
STUDENTS USING PT
$1300/TEACHER
$1200 TEACHER
TEACHERS USING PT
60

FIGURE 4.4

PRODUCTive Classrooms, was eventually sent to the original Project Director outside of the Shawnee Mission District.

Weber County School District

The Weber County School District of Ogden, Utah monitored the progress of students (1977-1980) as they advanced from elementary school through secondary school. They found that the slope of the achievement line through the grades was consistently declining in comparison to national norms. From grades two through twelve the district's basic skills analysis showed a decline in percentile scores on the standardized achievement tests for all groups of students; above average, average, and below average.

The combination of this downward trend and the Board of Education's mandate that schools emphasize teaching basic skills in reading, math, and spelling prompted the Weber County School District to apply for a Title IV-C adoptable grant from the State Department of Education in 1979. The grant was awarded for the 1979-80 school year and continued through the 1980-81 and 1981-82 school years. For the 1982-83 and 1983-84 school years, the state continued to support the program by purchasing materials for the district.

In the first year of the program 160 teachers and administrators including the total staff from seven elementary schools were trained. However, implementation was voluntary and not all of the teachers trained used Precision

Teaching in their classrooms.

After one year the project schools were compared to the rest of the district. Although the project schools still showed a decline in test score percentiles, grades two through six, in the Precision Teaching schools the range was -1 to -15 percentile points as compared to a range of -11 to -20 percentile points for the rest of the district.

During the second year of implementation all teachers K-6 in the seven targeted schools were required to use Precision Teaching. One hundred thirty-five teachers in seven elementary schools and 28 secondary teachers in three junior high schools used Precision Teaching techniques with 4,233 elementary students and 1,946 junior high students.

Currently, Precision Teaching is being used in 30 of the 35 schools by 260 teachers with 4,500 students. Figure 4.5 shows a celeration of x2.1 every five years over the five years of implementation. The ratio of teachers in the district to the number using Precision Teaching is 3:1.

Funds allocated for Precision Teaching decelerated by a factor of /40 over the five years of implementation. Costs per teacher using Precision Teaching went from $400 per year per teacher to only $10 per year per teacher in 1984 (See Figure 4.5).

Problems encountered during implementation include high teacher turnover (35-100 teachers per year in the district), teachers not understanding the value of the chart and data

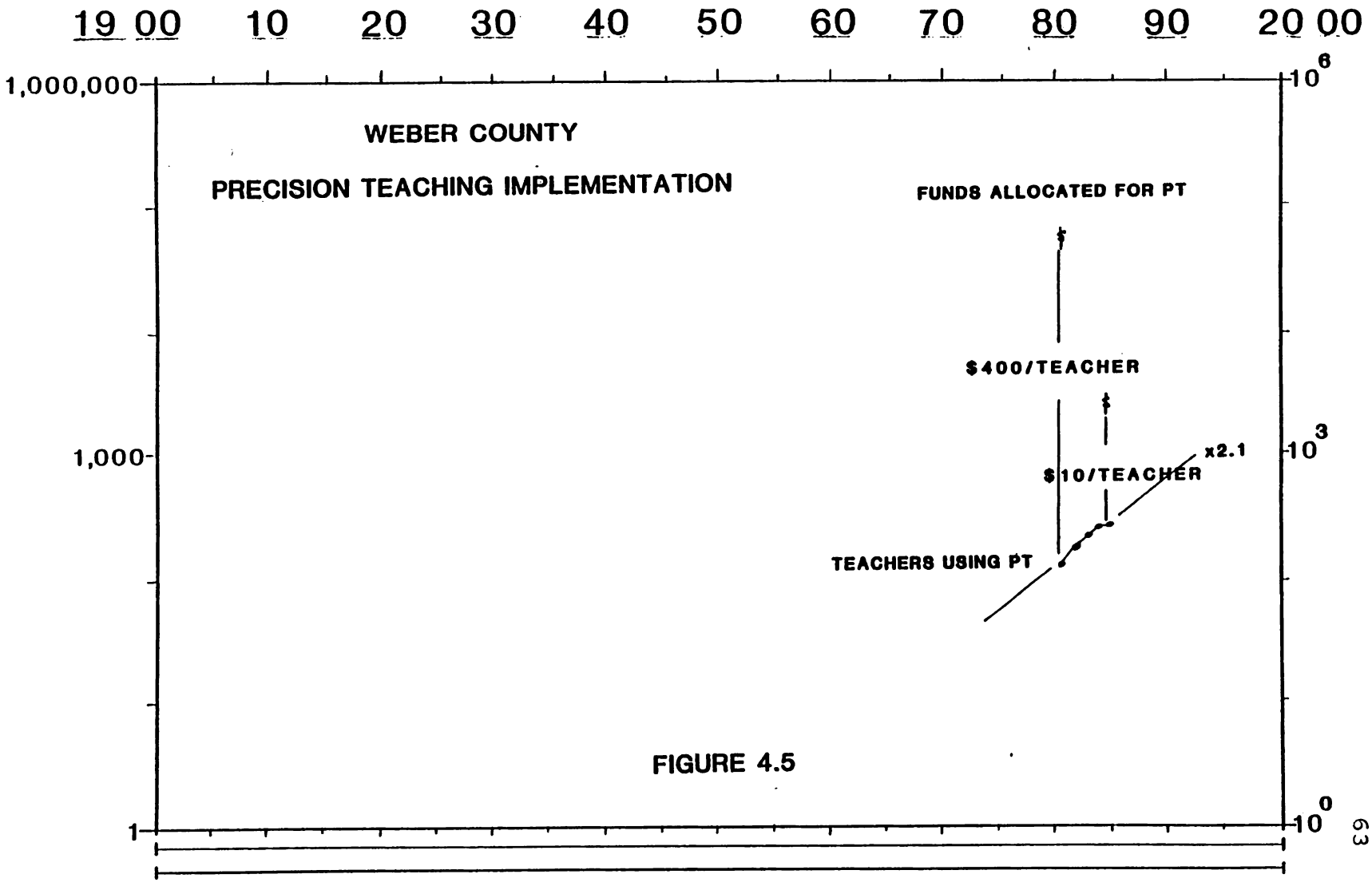
19 00
10
20
30
40
50
60
70
80
90
20 00
1,000,000
1,000
1
10^6
10^3
10^0
WEBER COUNTY
PRECISION TEACHING IMPLEMENTATION
FUNDS ALLOCATED FOR PT
$400/TEACHER
$10/TEACHER
x2.1
TEACHERS USING PT

FIGURE 4.5

collection, and management problems, i.e., adequate materials and a need for cross-age tutors in the primary grades.

The current Project Director stated that teachers in the district continue to use Precision Teaching because they have found it to be effective in maintaining and promoting skills, it is cost effective, and because it requires less time to do the same things that traditional education did over a longer period of time.

Father Flanagan's Boys Town

In 1979 Father Flanagan's Boys Town, a private residental program for boys and girls, hired a new Director of Education and a new Administrative Assistant for Program Development. They were hired to implement four specific programs; Precision Teaching, a social skills program, a tutoring program, and individualized instruction. The order of implementation was left to their discretion. Precision Teaching and the social skills program were implemented at the middle school first.

The first Precision Teaching workshop was organized for administrators in September of 1979. The teachers at the middle school were trained in September and November, 1979. The staff at the vocational school was trained in the Spring of 1980 and the high school staff was trained during the 1980-81 school year.

Precision Teaching was never required of teachers prior

to formal training. However, within two weeks of training teachers were required to implement the program in one class or content area. Within 4 to 6 weeks of training, they had to implement in all classes with all students at the high school level and in reading, math, and one area of their choice at the elementary level.

Only two out sixty-three teachers quit rather than use Precision Teaching.

All four programs have been implemented across all three schools. The last one, the tutoring program, was added during the 1983-84 school year.

Pre-post standardized achievement test comparisons have not been made. The system has changed standardized tests since Precision Teaching implementation and the administration decided that such a comparison would not be appropriate.

Currently all 63 teachers in all three schools are required to use Precision Teaching and the Standard Celeration Chart with all 420 students. Figure 4.6 shows a celeration of x1.4 every five years in the number of teachers using Precision Teaching.

The funds allocated specifically for Precision Teaching activities have had a decrease of /5 from 1979 to 1984.

The costs per teacher using Precision Teaching decreased from $220 per teacher per year in 1979 to only $35 per teacher per year in 1984.

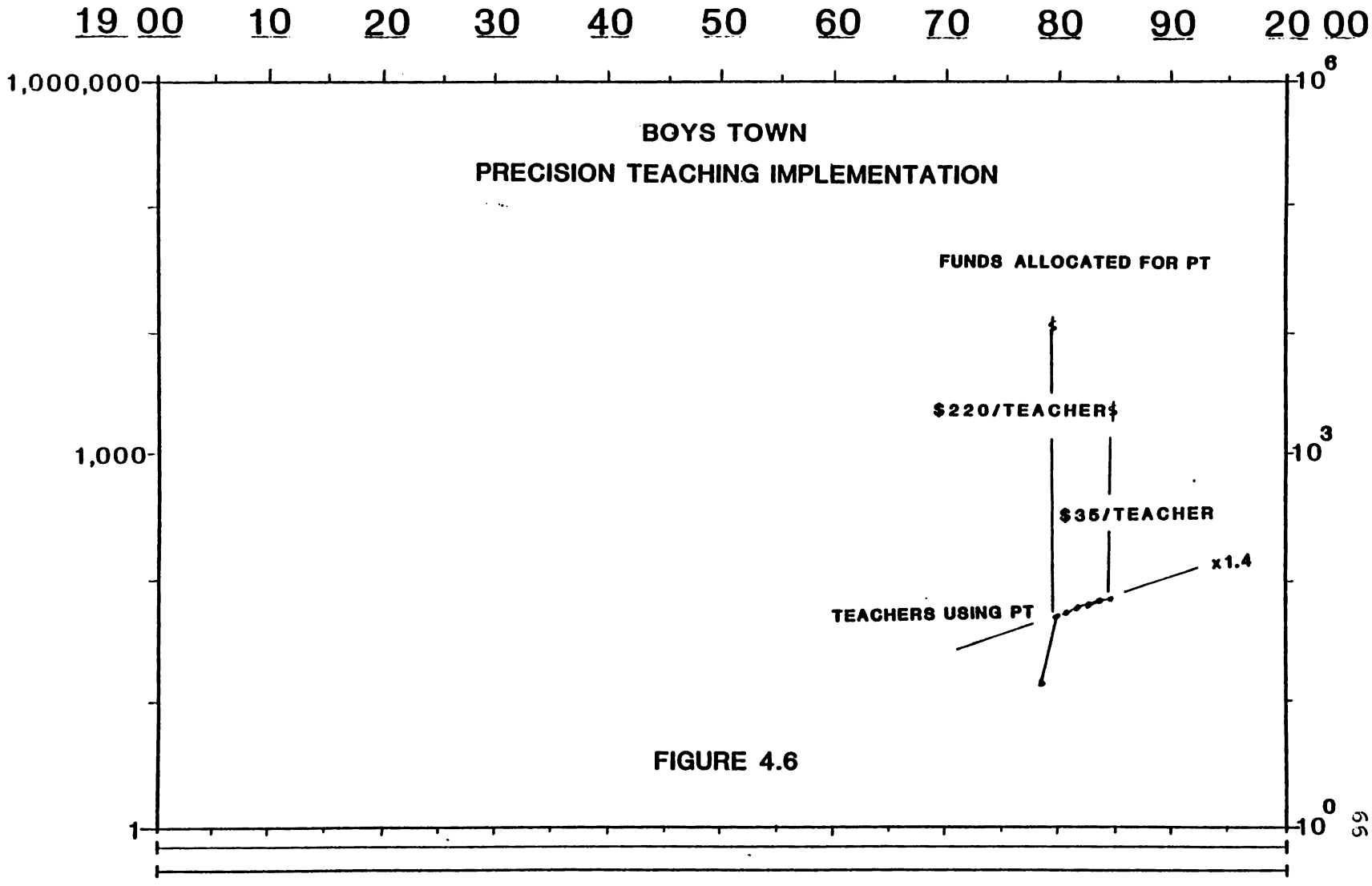
19 00
10
20
30
40
50
60
70
80
90
20 00
1,000,000
1,000
1
10^6
10^3
10^0
BOYS TOWN
PRECISION TEACHING IMPLEMENTATION
FUNDS ALLOCATED FOR PT
$220/TEACHER$
$35/TEACHER
x1.4
TEACHERS USING PT

FIGURE 4.6

Orange County School District

In 1980, the Orange County School District applied for and received a Title IV-C grant from the State of Florida to develop a training model and a curriculum for teachers of the mildly handicapped, K-6, using a Precision Teaching model.

An interest in Precision Teaching and its application was influenced by earlier associations with the University of Florida Special Education Department. University of Florida faculty had visited the district and presented workshops previously. Although there was some interest and use by individual teachers, no systematic program was developed until the 1980 grant.

Two new positions were created to train teachers, one funded through the grant and the second through the Florida Diagnostic Learning Resource Services (FLDRS). Over the three year period of implementation, the number of teachers using Precision Teaching has increased from 12 to 181. Figure 4.7 shows an increase by a factor of x14 in the number of teachers, both special and regular education, using Precision Teaching daily. The ratio of teachers in the district to teachers using Precision Teaching is 25:1, 25 teachers for every 1 using Precision Teaching.

Materials are provided by three sources; local school budgets, grant monies, and Florida Diagnostic Learning Resource Services. The FLDRS also pays for substitute teachers when necessary.

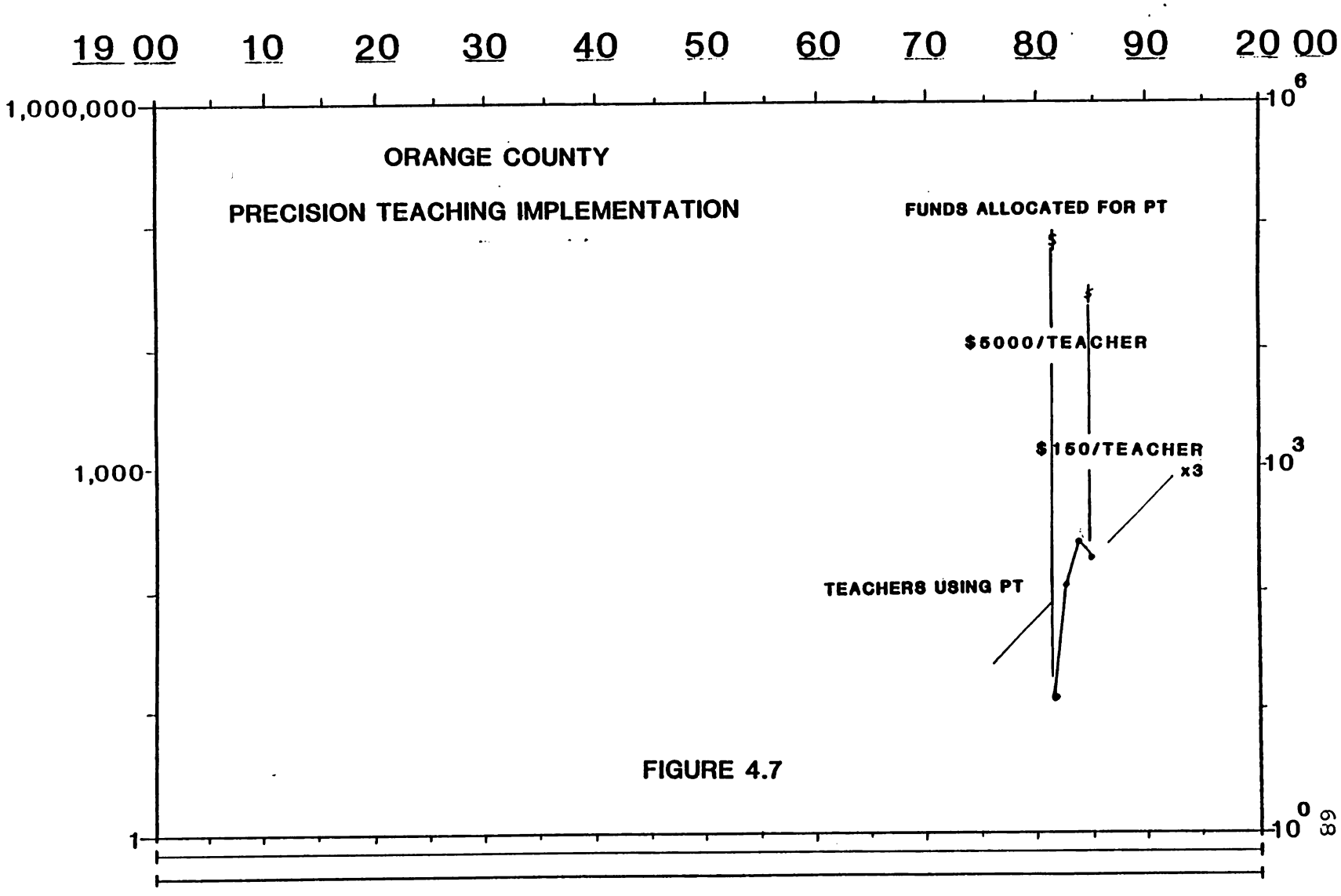
19 00
10
20
30
40
50
60
70
80
90
20 00
1,000,000
1,000
1
10^6
10^3
10^0
ORANGE COUNTY
PRECISION TEACHING IMPLEMENTATION
FUNDS ALLOCATED FOR PT
$
$
$5000/TEACHER
$150/TEACHER
x3
TEACHERS USING PT

FIGURE 4.7

Training and up-dating of teachers is accomplished by using the district's in-service and staff development days and visits to individual classrooms.

Total funding has decreased by a factor of /3 over the four years since the original grant was awarded.

Costs per year per teacher using Precision Teaching have decreased from $5000 per teacher per year in 1980 to $150 per teacher per year in 1984.

One elementary school adopted Precision Teaching school wide. An experimental-control group study using Precision Teaching materials and standardized achievement test data for the comparison was conducted. Those data, however, have not been completely analyzed.

State block grant funding is expected to terminate at the end of the 1984-85 school year. The school district is now making plans to incorporate one trainer's position with the same job description and responsibilities into the district's regular programs. The Project Director attributes this commitment to support from the Director of Exceptional Student Education who is strongly committed to data-based management. The second position will continue to be funded by FLDRS.

Findings

Several findings are evident from the histories of the ten Precision Teaching projects.

Funding

1. The dollar amount of funds allocated for Precision Teaching either stopped completely as in the case of the SST project and Project Product of Shawnee Mission, or declined over the duration of the project. The median deceleration every five years was /3.8 with a range of /2.3 to /7.0.

2. The large budget amounts in the beginning of the projects were the result of initial start up costs, training, materials, and consultants, not needed in later years.

3. Large amounts of money through grants are not always necessary to implement Precision Teaching in a district.

4. The Great Falls project is an exception to the decrease in funding trend identified in the other projects. Although state funding stopped completely and federal funding for dissemination purposes is decelerating slightly, local funding has doubled from 1977 to 1984 as the district continues to support personnel on a half time basis.

Costs per Teacher per Year

1. The cost per teacher per year decreased in all projects from the initial funding year to the present except Minneapolis, SIMS, which started as a local project and later became a state funded project.

2. The cost per teacher per year in the initial funding year ranged from $25 per teacher per year to $8000 per teacher per year with a median of $300 per teacher per year.

3. The cost per teacher per year for the six active programs ranges from $5 to $400 with a median of $60 per teacher per year. See Figure 4.8.

4. The three programs whose initial cost per teacher per year was less than $1000 per teacher per year also have the lowest current per teacher per year cost (less than $50 per teacher per year); Boys Town, Weber County and Bemidji.

Support in the District

1. If the project becomes an integral part of the school system it has a better chance of enduring, e.g., the SIMS project of Minneapolis, the Bemidji project, and the Boys Town Project.

2. The problem occurs when this integration is a function of administrative authority alone, as evidenced by the termination of Precision Teaching at Spaulding Youth Center, Project Product of Shawnee Mission, Hastings County School District, and the SST project of Washington. The Great Falls project, Weber County, and Orange County have not changed administrators yet, so the effect of this type of change would be speculative.

3. Precision Teaching was mandated in private schools and in the Special Education Department in Great Falls. When the Director of Spaulding Youth Center left, the program was terminated. Great Falls and Boys Town, the other two mandated programs, have not had a change of administrators, so the

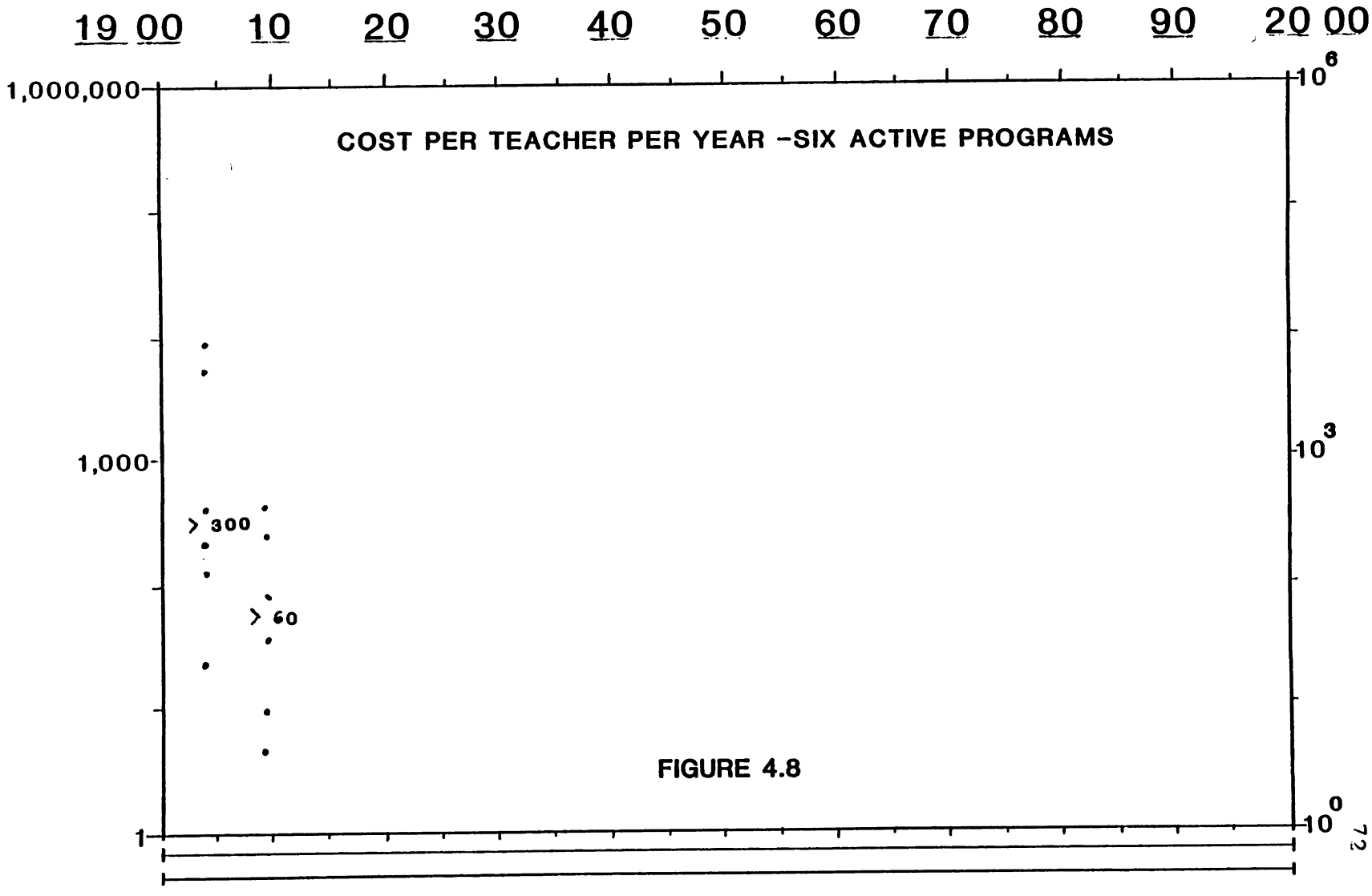
19 00
10
20
30
40
50
60
70
80
90
20 00
1,000,000
10^6
COST PER TEACHER PER YEAR -SIX ACTIVE PROGRAMS
1,000
10^3
> 300
> 60
1
10^0

FIGURE 4.8

mandate continues.

Special Education vs. Regular Education

1. Six of the ten programs focused on Special Education students first, and four of that six have since expanded to regular education.

2. In special education, the Standard Celeration Chart is used to monitor student progress and make curricular change and remediation decisions. In regular education, the emphasis is more on the instructional techniques, materials and timings instead of monitoring progress.

3. Regular education public schools provide training to teachers, but its use is voluntary and, as demonstrated by the Great Falls project, only half of the teachers trained continued to use the program.

CHAPTER 5

Analysis of Variables Affecting Precision Teaching Program Durability

Of the ten programs researched in this study, six are still active and four are inactive. During the 1983-84 school year, across the six active programs, Precision Teaching was being used in 276 schools by 848 teachers with approximately 15,000 students,(see Table 1 Appendix B, Current Precision Teaching District Saturation). Precision Teaching is still being used by a few teachers in Spokane and Tacoma of the SST Project, Shawnee Mission, and Hastings County, but to a limited degree. The programs range from three to fourteen years duration with a median of seven years.

All ten of the programs successfully demonstrated the efficacy of Precision Teaching as a monitoring tool. Why then, are some still active and others inactive? What are the variables which seem to ensure successful continuation and growth? What conditions seem to lead to discontinuation and decay?

Findings

First, a look at the variables across programs. The funding sources were evenly split between local funding (5 programs) and state (4 programs) or federal (1 program). State monies were actually federal support funneled through the

states; Title III, Title IV-C, or Title VI-Part G. At the local level, first year's start up support ranged from $250 to $10,000 with a median of $1000. At the state or federal level the range was $65,000 to $98,000 with a median of $70,500. The amount spent by all programs as first year start up cost totaled $400,500,(see Table 2, Appendix B, Funding of Precision Teaching Projects).

Table 5.1, Durability Factors and Precision Teaching Implementation, displays the relevant variables, in summary form. Five of the six active programs show a deceleration in funds allocated for Precision Teaching over the existence of the projects. See Figure 5.1. The decelerations range from /15 to /1.8 every five years with a median celeration of /4.8. One of the six programs, Minneapolis, actually had an acceleration of funds locally, x6.2 every five years, over the twelve years from its beginning in 1972 to the present. There was a period from 1975 to 1978, however, when Title VI-Part G monies were used to validate the SIMS Project. These monies totaled nearly half a million dollars over that three year period.

The Great Falls Project and the SIMS Project also received funds for national dissemination of their projects through the National Diffusion Network. These amounts are not included in this study since they do not reflect money used for district implementation.

In seven of the ten programs initial interest in

Table 5.1

Durability Factors and Precision Teaching Implementation

Year	District	Years A:I	Classrooms Start	Classrooms Now	Grade	Curriculum B (3)	Curriculum C (5)	Curriculum A (3+)	Attitude of Admin. Hierarchy Start (4)	Attitude of Admin. Hierarchy Now (4)	First Interest	Responsibility Person	Responsibility Position	Effect of Director Change	Support Groups	Maintenance Problems	Program Celeration (most recent)
1970	Bemidji	14: 0	S	S R	K-6	2	0	1	2+	3+	A	A	I	C =	4	----	x1.4
1971	SST	3:11	S	-	1-4	3	0	0	4+	3-	A	A	N	T -	0	S $	/2.3
1972	Hastings Co.	10: 4	S R	S R	K-6 9-11	3	5	3	4+	2-	T	T	I	T -	5	C M S	/3.7
1972	Minneapolis	12: 0	S	S R	K-12	3	3	3+	2+	3+	T	A	N I	C =	7	C M	x3.5
1973	Great Falls	11: 0	S	S R	K-12	3	4	3	3+	3+	A	A	N I	N/A	8	C M	x1.4
1974	Spaulding	7: 3	S	-	K-8	3	5	3+	3+	3-	A	A	I	T -	0	S	/7.0
1975	Shawnee Miss.	3: 6	S R	-	K-12	3	2	1	2+	3-	T	T	N	T -	0	M S $	/3.9
1977	Weber County	7: 0	S R	S R	K-9	3	2	1	3+	3+	A	A	I	C =	7	C M	x2.1
1979	Boys Town	5: 0	R	R	K-12	3	5	3+	2+	3+	A	A	I	N/A	7	S	x1.4
1980	Orange County	4: 0	S	S R	K-9	3	2	0	3=	3+	A	A	N	C +	7	S	x3.0
Median		7:0				3	3	3							7		
Range		3-14:0-11				2-3	0-5	0-3+							0-7		

Key

A Active S Sped Ed
I Inactive R Reg Ed

B Basic Skills
C Content
A Art

+ Supportive
= Neutral
- Nonsupportive

A Adminis.
T Teacher

I Increased Respons.
N New

C Changed
T Terminated
+ Increased
= No effect
- Decrease

C Charting
M Management
S Support
$ Funds

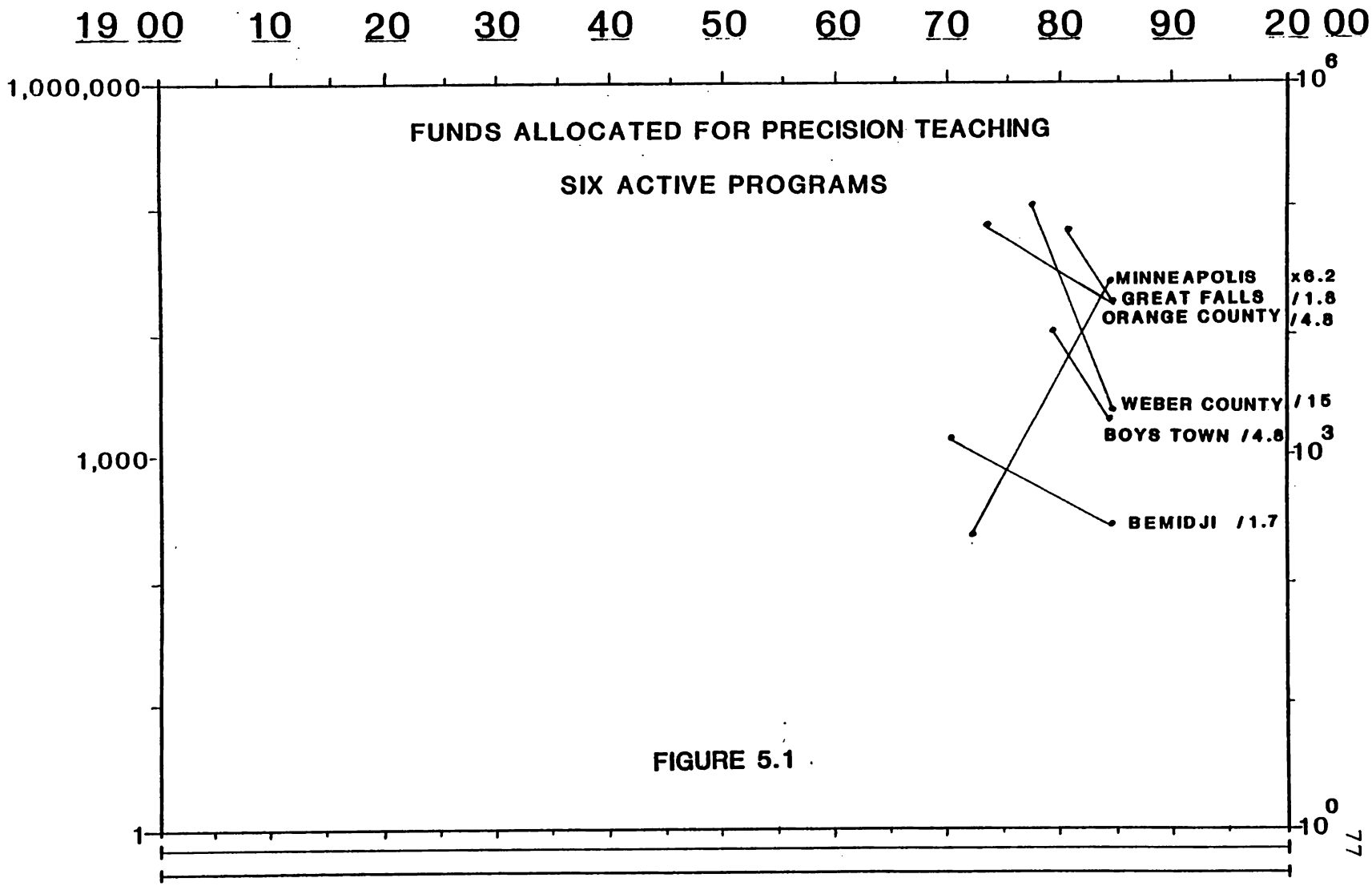
19 00
10
20
30
40
50
60
70
80
90
20 00
1,000,000
1,000
1
10^6
10^3
10^0
FUNDS ALLOCATED FOR PRECISION TEACHING
SIX ACTIVE PROGRAMS
MINNEAPOLIS x6.2
GREAT FALLS /1.8
ORANGE COUNTY /4.8
WEBER COUNTY /15
BOYS TOWN /4.8
BEMIDJI /1.7
77

FIGURE 5.1

Precision Teaching came from administrators rather than teachers. In the four inactive programs the initial interest was evenly split, two administrators and two teachers.

In seven of the ten, the person responsible for implementation of Precision Teaching in the district was an administrator. Two of the programs, with this position held at the teacher level, are no longer in existence, Hastings County and Shawnee Mission.

Five of the ten programs added a new position to supervise Precision Teaching in the district. Two of those, Great Falls and SIMS, not only added a new position for training, but also added to the responsibility of a present special education administrator as administrator of the program, locally and nationally.

In four of the ten there has been a change of project directors resulting in no difference in policy in three and an increase in use of Precision Teaching in one. In all four cases where the project director's position was terminated, the result was a deceleration or complete cessation of Precision Teaching. The reasons for termination were either the end of funding of the program or philosophical differences between director and district power structure. The two projects having the shortest duration, SST and Project Product, ended when the state or federal funding ended, after three years. Hastings County (10 years) and Spaulding Youth Center (7 years) continued as long as there

was administrative support. However, when that ceased, the project director's position was terminated and the project ended.

Four of the six active programs increased in administrative support from the program's initiation to the present. Two stayed the same and all four of the inactive programs decreased in support. Table 3, Appendix B, Precision Teaching Support by District Administrators, shows the support by position.

Eight possible support groups were identified; superintendent, assistant superintendent, special education director, supervisor, principals, teachers, students, and parents. Support by these groups ranged from none in three programs to all eight in one. Teachers, students, and special education directors were identified as supportive in seven of the districts surveyed. The least supportive group identified was the assistant superintendents with only two districts indicating their support. Table 4, Appendix B, Current Support of Precision Teaching by District Team, displays the support by program and team member.

Six of the ten programs started in special education only and four of these have expanded to regular education. Three programs initiated Precision Teaching in both special and regular education and one program began only in regular education. SST and Spaulding Youth Center, both inactive programs, were strictly special education programs, while

Hastings County and Shawnee Mission were both regular and special education programs.

Four of the programs spanned K-12, three were elementary and junior high, two were elementary only, and one district a split, K-6 and 9-11. Generally implementation began at the elementary level and spread upward through the grades.

The most common curriculum areas for Precision Teaching were the basic skills of reading, math, and spelling. Nine of the ten programs, with the exception of Bemidji, implemented in all three basic skill areas. Table 5, Appendix B, Precision Teaching by Curriculum Area, lists eleven subject areas and a category "other" covering curriculum areas such as French, Spanish, religion, vocational skills, typing, and shorthand.

Project directors identified four major implementation problem areas. The areas were charting, including teaching students to chart and teaching teachers the value of the chart as a monitoring and decision making device; management of materials and timed activities in the classroom; support from building and district administrators and assistance provided to teachers; and monetary support for continuation of the program.

Four of the programs had charting problems, three management problems, four support, and two monetary problems (SST and Shawnee Mission). The maximum number of problems indicated were three, Shawnee Mission.

Project directors were asked whether the use of Precision Teaching was accelerating, maintaining, or decelerating in the district. The former directors of the four inactive programs indicated deceleration. This was confirmed by present district personnel. Of the six active projects, directors identified three as accelerating and three as maintaining. However, checking these perceptions against the actual data, Figure 5.2, all six projects are accelerating with celerations ranging from x1.4 every five years to x3.7 every five years. Boys Town reported a maintaining trend because all teachers are now trained and required to use Precision Teaching. This will show a maintaining trend in the future. Great Falls indicated a maintaining trend and although the celeration has turned down from x3.7 every five years to a x1.4 most recent celeration, the district is still accelerating in the number of teachers using Precision Teaching. Weber County School District also indicated a maintaining trend and the data show a x2.1 celeration overall.

The ratio of schools, teachers, and students in each district to the numbers using Precision Teaching is shown in Table 1, Appendix B. Both ratios and actual numbers across programs are listed.

The ratio of total schools to schools using Precision Teaching ranges from 1:1 to 5:1. At the teacher level the range is 1:1 to 50:1 and at the student level 1:1 to 24:1.

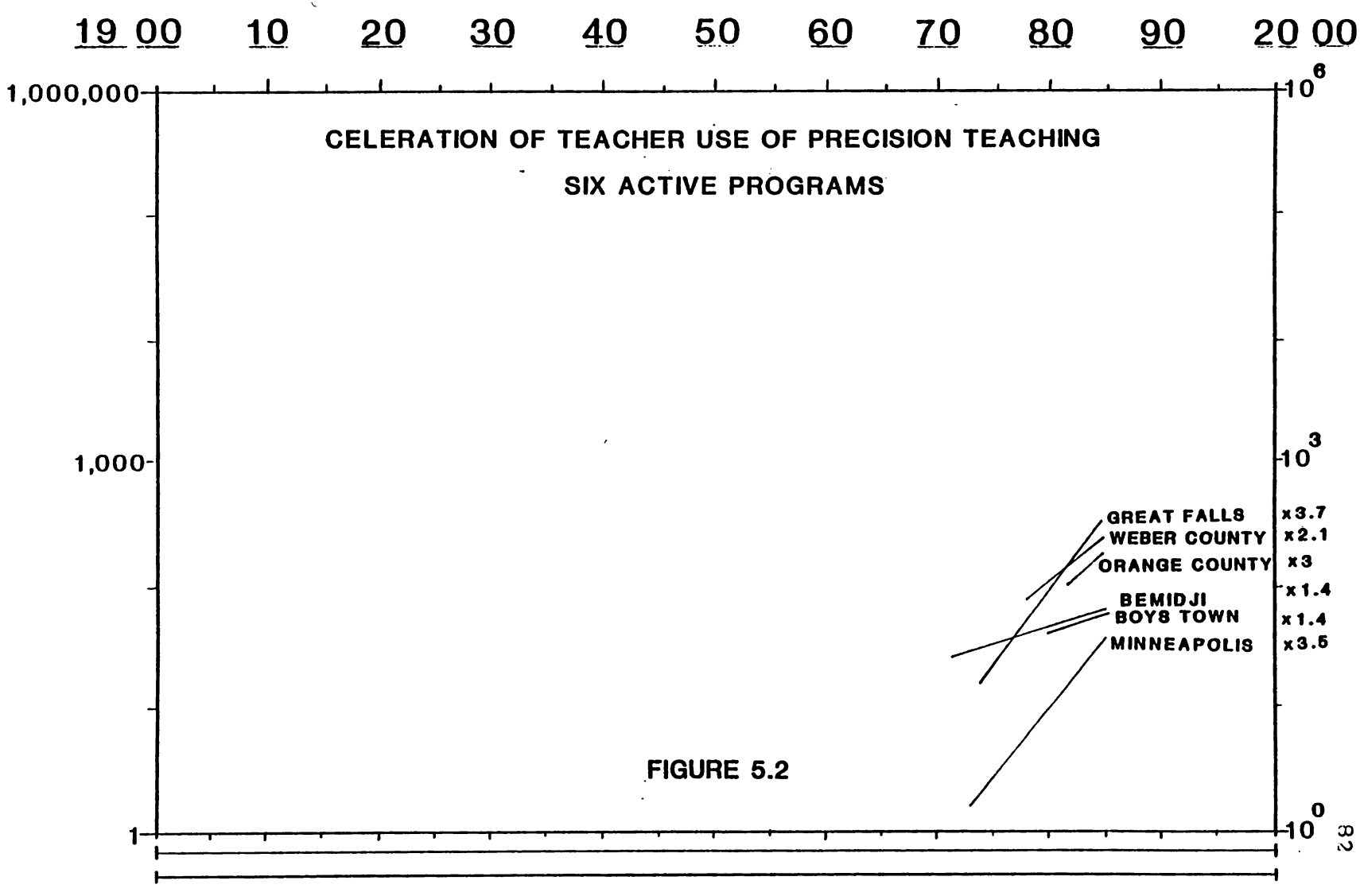
19 00
10
20
30
40
50
60
70
80
90
20 00
1,000,000
1,000
1
10^6
10^3
10^0
CELERATION OF TEACHER USE OF PRECISION TEACHING
SIX ACTIVE PROGRAMS
GREAT FALLS x3.7
WEBER COUNTY x2.1
ORANGE COUNTY x3
x1.4
BEMIDJI
BOYS TOWN x1.4
MINNEAPOLIS x3.5
82

FIGURE 5.2

The 1:1 ratio in all three cases is Boys Town, a mandated program. In Figure 5.3 the differences are expressed as ratios. Hastings County is included in these data even though it is classified as an inactive program. The original project director is still close enough to the district to know how much Precision Teaching is still being used. The top of the range in schools 5:1, second in teachers 48:1, and top in students 24:1 are the Hastings County comparisons. Again continued use of Precision Teaching in this district is very limited.

Table 6, Appendix B, Frequencies of Charting, shows that most students across programs are using Precision Teaching in two curriculum areas with a median average weekly celeration of x1.25. All programs report two line learning pictures monitoring both correct and error patterns.

Only two programs indicated that teachers were charting their own behavior and then to a very limited degree.

Discussion

Leithwood and Montogomery (1982) described two kinds of planned change; change occuring within a system leaving the total system unchanged and changes to the entire system. In the ten programs reviewed, a change within the system occurred in eight of the programs. The only two changing the entire system were the private, mandated programs; Boys Town and Spaulding Youth Center. The total teacher and student

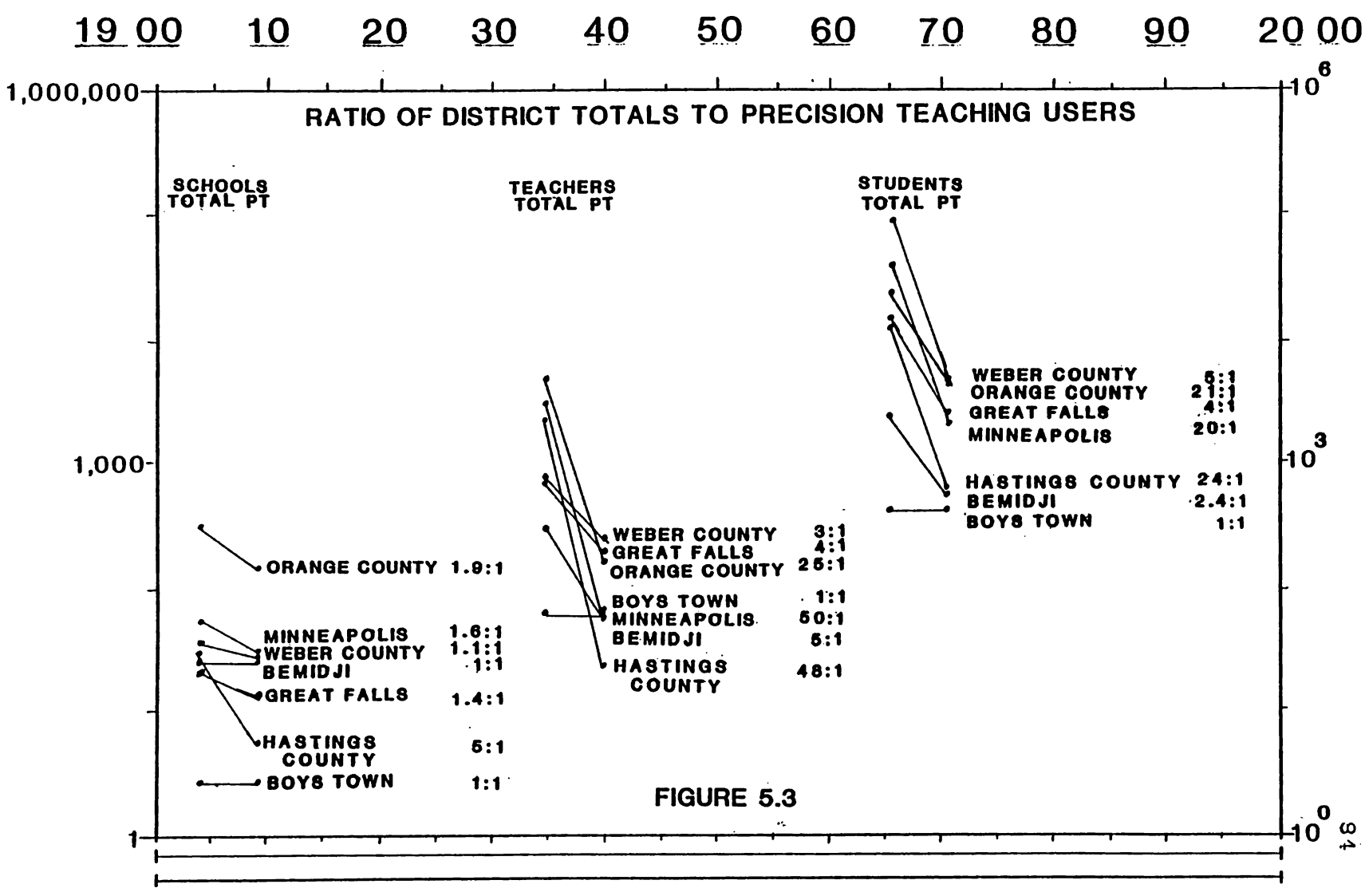
19 00
10
20
30
40
50
60
70
80
90
20 00
1,000,000
1,000
1
10^6
10^3
10^0
RATIO OF DISTRICT TOTALS TO PRECISION TEACHING USERS
SCHOOLS TOTAL PT
TEACHERS TOTAL PT
STUDENTS TOTAL PT
ORANGE COUNTY 1.9:1
MINNEAPOLIS 1.6:1
WEBER COUNTY 1.1:1
BEMIDJI 1:1
GREAT FALLS 1.4:1
HASTINGS COUNTY 5:1
BOYS TOWN 1:1
WEBER COUNTY 3:1
GREAT FALLS 4:1
ORANGE COUNTY 25:1
BOYS TOWN 1:1
MINNEAPOLIS 50:1
BEMIDJI 5:1
HASTINGS COUNTY 48:1
WEBER COUNTY 5:1
ORANGE COUNTY 21:1
GREAT FALLS 4:1
MINNEAPOLIS 20:1
HASTINGS COUNTY 24:1
BEMIDJI 2.4:1
BOYS TOWN 1:1
94

FIGURE 5.3

populations in these two programs are much smaller when compared to the public school districts. This difference makes training of teachers and monitoring of the program easier to accomplish.

The type or amount of initial funding, local or state and federal, is not as important as the subsequent funding commitment. Commitment of local funds is necessary for continuation of the program. Berman and McLaughlin (1978) found that the success or failure of projects was dependent on how districts implement their projects, not on the type of sponsorship. All six of the active programs now have a local commitment of funds and only three of these began with local funds. Three of these have a combination of local and state funding; it will be interesting to note changes in Precision Teaching celeration when state funding is removed completely.

Administrative leadership and support was identified as a major component in effective schools in the school effectiveness literature and necessary to successful changes in the planned change literature. Parish and Arends (1978) found that administrators played a key role in selecting and coordinating training for new programs within a district.

This study supports these findings. First, in seven of the ten programs the initial interest was administrative rather than instructional and responsibility for the program was administrative also. In comparing initial support of the administrative hierarchy to present support, it has either

increased or stayed constant at a high level in the active programs, while decreasing over time in the inactive programs.

Teacher interest and use was not enough to keep a program going when the project director's position was terminated or funds terminated as evidenced by the decline in the four inactive programs.

The least expensive program, cost per teacher per year, both initially and at the present time is Bemidji Interdistrict Regional Cooperative. It also has the longest existence, 14 years, showing that durability is not a function of high cost.

The SIMS project of Minneapolis and the Great Falls project have the next longest existence, 12 and 11 years respectively. They are also more expensive at $400 and $90 per teacher per year. They have both a special education administrator who has added responsiblity for Precision Teaching and an added position part time. These two programs have been receiving dissemination funds at the federal level which may have an affect on their durability within the district also.

Figure 5.4 shows the deceleration in cost per teacher per year across seven of the ten programs. Three inactive programs, SST, Spaulding and Hastings County did not have these data available.

The three least costly programs are those in which no

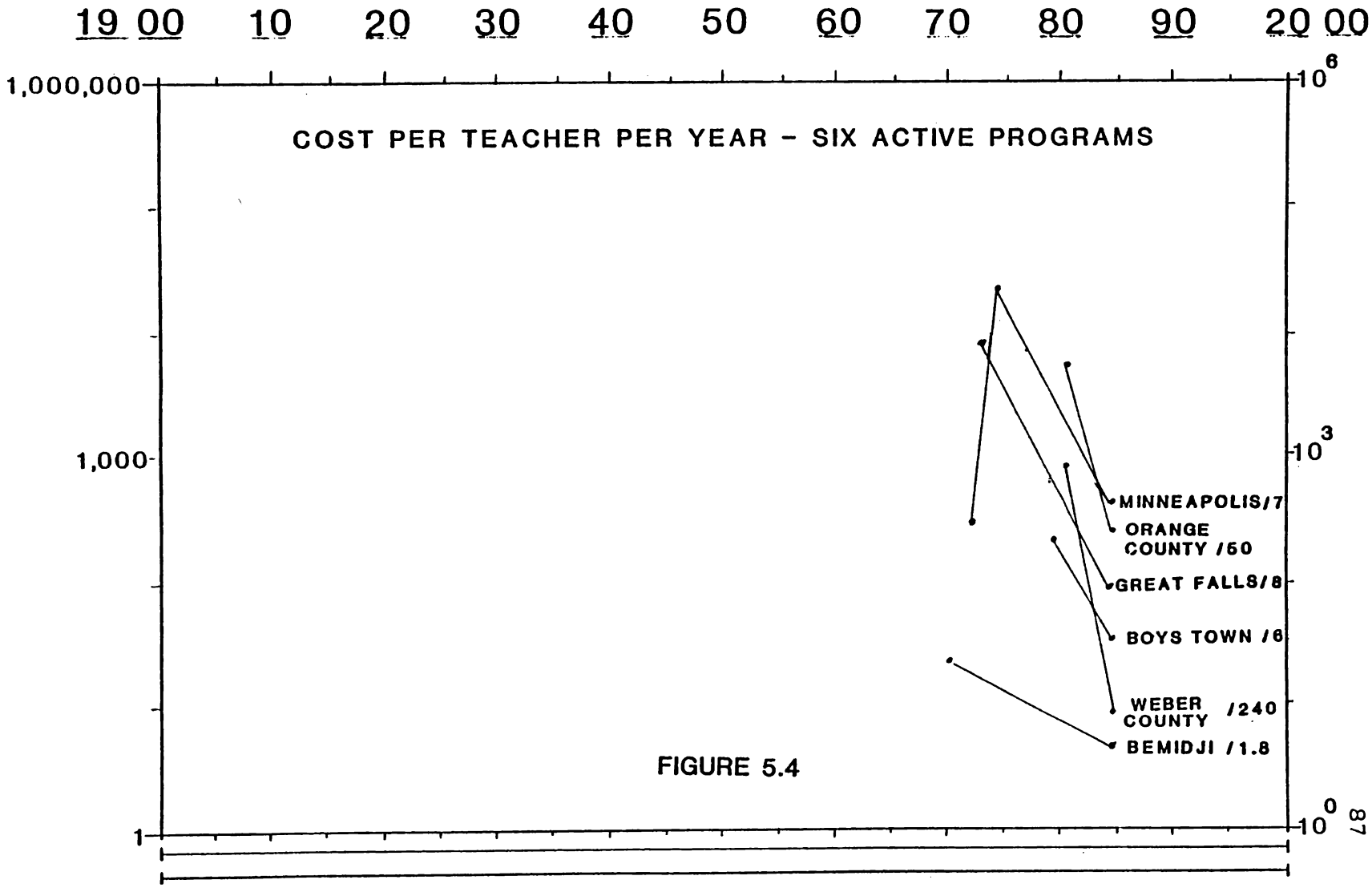
19 00
10
20
30
40
50
60
70
80
90
20 00
1,000,000
1,000
1
10^6
10^3
10^0
COST PER TEACHER PER YEAR – SIX ACTIVE PROGRAMS
MINNEAPOLIS/7
ORANGE COUNTY /50
GREAT FALLS/8
BOYS TOWN /6
WEBER COUNTY /240
BEMIDJI /1.8
87

FIGURE 5.4

new positions were added, the responsibility for Precision Teaching is a part of a present administrator's position. One of those is the most durable, Bemidji, and the other two Weber County and Boys Town, have the shortest existence, only four and five years respectively.

Monitoring of progress in basic skill areas-- math, reading, and spelling were the most common areas of implementation, then content areas such as English, science, social science, with the arts music, art, physical education monitored less often. This trend is consistent with the national trend in Precision Teaching, emphasis of basic skills first and then expansion to other areas.

Implementation of Precision Teaching in special education first occurs more frequently with an expansion later to regular education. Elementary (K-6) implementation occurred across all programs; with use at the secondary level occurring less frequently.

Project directors identified and categorized these problems with implementation; charting, management concerns or support concerns. No programs identified more than two areas. All four inactive programs identified support problems, both administrative and funding. Orange County School District was the only active program indicating support problems and this was a concern for manpower, enough trainers to serve all of the teachers trained or interested in receiving training. Charting and management problems seem

to be teacher concerns.

The six active projects are continuing to accelerate in teachers use, although the most recent accelerations are not as steep as the overall trends. There are still many teachers not using Precision Teaching in most of the districts. Data collected by the Great Falls Project shows that only one half of all of teachers trained actually are using Precision Teaching. The proportion of total schools to schools using Precision Teaching (median x1.4) indicates that almost all schools have at least one teacher per school using Precision Teaching. In most cases, this lone teacher is a special education teacher, ie. Bemidji, Minneapolis, Great Falls, and Orange County.

CHAPTER 6

Summary and Conclusions

Summary

This study reviewed ten representative major Precision Teaching programs to discover factors contributing to their success or failure.

Telephone interviews were conducted with project directors of both active and inactive programs to determine past and current practices. An implementation survey was sent to active programs to determine the number of teachers using Precision Teaching and number of years per teacher.

Four of the ten programs are inactive; six are active, five increasing in use while one, Boys Town, is at its maximum level of use, with all Boys Town schools, teachers, and students using Precision Teaching.

Administrative support was found necessary for continuation of successful programs. Specific funding sources or amounts do not appear necessary for the success of a program.

Precision Teaching is being used across all grade levels and in most content and basic skill areas, in both regular and special education.

Conclusions

Factors which are related to discontinuation of programs:

1. Lack of administrative support
2. Change of central administration and district's philosophy concerning data based management
3. Termination of project director's position
4. Termination of funds with no local commitment made to replace state or federal funds.

Factors contributing to successful implementation of Precision Teaching are:

1. Administrative support, at both program and central administration level
2. Integration of Precision Teaching into district's total program
3. Local funding
4. Responsibilities included as part of a present administrator's position and the program not treated as a special project.

Factors which are common across Precision Teaching programs:

1. Most programs begin first in special education and then spread to regular education
2. Precision Teaching is used first in the basic skill areas (math, reading, and spelling) and then spreads to other areas
3. Precision Teaching is used at all grade levels.
4. Cost per teacher per year decreases over the years

of implementation.

Administrative Implications

How can school districts currently using Precision Teaching or those considering the adoption of Precision Teaching use the findings of this study?

First, the importance of administrative support must be stressed. Special education programs with supervisors committed to Precision Teaching have been more successful than regular education programs. These special education supervisors seem to have more control over their teachers and their use of Precision Teaching than do building principals because of P.L. 94-142. It is easier to mandate a data based management system in special education than in regular education.

Administrative support must be part of a policy of the program, not the project director's personality. Support should be broad based involving more individuals than just the project director.

Second, this administrative support should include local monetary support. If the program is treated as a regular line item in the district's budget, instead of a special program, it is more likely to be included yearly and not be subject to cuts as financial resources decrease.

Third, implementation of Precision Teaching can be successful at all grade levels and across all subject areas. However, it may be easier to start with elementary classroom

teachers in the basic skill areas of math, reading, and spelling.

Fourth, the commitment to Precision Teaching as a program recording, monitoring, and decision making procedure must surpass classroom use alone. Teachers and administrators should be comfortable using the Standard Celeration Chart for their own personal and professional projects to understand the usefulness of the SCC and deepen their commitment to it. To date, it is generally used at the classroom level only. Lovitt (1977) said that if teachers are taught to chart their own behaviors and have altered them, they are better prepared to measure and change certain academic and social behaviors of their students.

Although the goal of all ten projects was to increase student learning through daily monitoring of student progress, the emphasis has been primarily on performance, (number per minute) rather than learning (celeration). Some of the programs encourage minimum expected celerations e.g., x1.25 per week in Great Falls, and x1.3 to x1.6 per week in SIMS, yet the major emphasis has not been on celeration, but frequency. Aims generally relate to frequency rather than celeration, when, in fact, the major emphasis should be celeration first and frequency second.

Even more disturbing is the fact that although the goal of all ten projects was to increase student learning, not one of the ten recorded the amount of student learning produced

by using standard achievement test yearly gains as independent evidence of program success.

Last, and most importantly students, teachers, and administrators should be positively reinforced for student growth. Behavior that is not reinforced dies. We have not built a strong enough reinforcement system into Precision Teaching implementation. The procedure is a valid way to measure student learning, and can measure the individual growth of each student. Currently, however, neither students nor teachers are rewarded appropriately for student learning.

At the Fourth Annual Winter Precision Teaching Conference held in Park City, Utah, April, 1984 Ogden Lindsley stated that unless we reinforce teachers for student learning, Precision Teaching will be only temporarily supported by federal funds or administrative whim.

In 1971 in an article entitled Precision Teaching in Perspective: An Interview with Ogden R. Lindsley, Ogden Lindsley discussed future strategies and stated that Precision Teaching can be used to wed the best techniques for monitoring the performance of students, with the best programs for maximizing dynamic curriculum and individual learning, to chart inner behaviors to provide man with the most good, the most help to self, to accelerate the ability of students not being challenged currently in regular education, and to challenge children to make learning opportunities.

The technology and interest is here, the next step is to reward the best use of both.

Suggestions for on-going programs

Program directors should collect product data as well as process data. Process data includes number of teachers trained and/or using Precision Teaching, number of students, curriculum areas, grade levels, types of programs, and costs. These data should be charted yearly to display the celerations for use in program planning. Product data includes individual student frequencies and celerations and can be recorded by pinpoint, curriculum area, grade level, classroom and charted as frequency distributions. Comparisons can be made across grade levels, classrooms, schools, and curriculum areas for program and teacher evaluation purposes. Independent product data can show yearly gains on standard achievement tests.

Provision of supplies and training opportunities is not enough, an active involvement in data collection and interpretation should be the responsibility of both building and program administrator.

Administrators need more than just a surface knowledge of the techniques. They should also be taught how to use the Standard Celeration Chart effectively in their own data collection and program planning.

Pre-post test and longitudinal results should be

collected to monitor the progress of students over time.

A system of rewards for student gain should be developed for teachers, students, and administrators to strengthen and\ maintain their use of Precision Teaching in the district, to make it worth their time to work for this student improvement.

Recommendations for further research

Given the proliferation of Precision Teaching in school districts, comparisons and monitoring of these wide reaching programs needs to start.

The present study was the first attempt to look at the durability and continuation of Precision Teaching programs across individual districts and identify variables which seem to affect this durability.

Future studies could refine this search by including site visits to the districts to interview teachers and administrators.

A follow up of this study, looking at the same programs five years from now would also yield information about the level of implementation and if the variables identified in this study are still valid.

Although the present study looked at administrative support as a major concern; the extent of administrative involvement was not measured. Future studies should focus on administrative involvement, what do administrators of

successful prodgrams do or not do in their support or non-support of Precision Teaching.

Collection and sharing of this knowledge would provide the field of Precision Teaching with a direction based on empirical data, and hopefully a way to not only spread the knowledge of Precision Teaching and its uses, but also ensure its endurance and further improvement.

Albrecht, P.L. (1981). Using Precision Teaching Techniques to Encourage Creative Writing. Journal of Precision Teaching, 2:1, 18-21.

Albrecht, P.L. (1984). Integrating Precision Teaching Studies Using Meta-analysis: The Analysis of Analyses. Unpublished manuscript, University of Kansas.

All, P. (1971). From Get Truckin' to Jaws, Students Improve Their Learning Picture. Unpublished Masters Thesis, University of Kansas.

Bates, S. and Bates, D.F. (1971). "...and a Child Shall Lead Them": Stephanie's Chart Story. Teaching Exceptional Children, Spring, 111-113.

Beck, R.J. (1976). Report for the Office of Education Dissemination Review Panel, 1976, Special Education. Great Falls Public Schools, Precision Teaching Project: Great Falls, Montana.

Beck, R.J. (1979). Report for the Office of Education Dissemination Review Panel, 1979, Regular Education. Great Falls Public Schools, Precision Teaching Project: Great Falls, Montana.

Beck, R.J. (1981). Curriculum Management Through a Data Base: Validation Report for ESEA Title IV-C. Great Falls Public Schools, Precision Teaching Project: Great Falls, Montana.

Beck, R.J. (1981). High School Basic Skills Improvement Project: Validation Report for ESEA Title IV-C. Great Falls Public Schools, Precision Teaching Project: Great Falls, Montana.

Beck, R.J. (1981). Precision Teaching Training: A Follow-up Study, 1975-1981. Paper presented at Precision Teaching Conference - Big Sky III: Kalispell, Montana

Berke, J.S. and Moore, M.T. (1982). The Developmental View of the Current Federal Government Role in Elementary and Secondary Education. Phi Delta Kappan, 65:3, 333-337.

Berman, P. and McLaughlin, M.W. (1978). Federal Programs Supporting Educational Change: Factors Affecting Implementation and Continuation, Vol. 7, Santa Monica, California: Rand.

Berquam, S. (1983). Administrative Charts. Journal of Precision Teaching, 4:1, 21-22.

Bower, B. and Orgel, R. (1981). To Err is Divine. Journal of Precision Teaching, 2:1, 1-12.

Brookover, W.B. and Lezotte, L.W. (1977). Changes in School Characteristics Coincident with Changes in Student Achievement. East Lansing: Michigan State University, College of Urban Development.

Brookover, W.B., Beady, C., Flood, P., Schweitzer, J., and Wisenbaker, J. (1978). School Social Systems and Student Achievement. East Lansing: Michigan State University, College of Urban Development.

Brown, C. and Gibson, B. (1983). Monitoring the Use of a Specialized Library. Journal of Precision Teaching, 3:3, 6-8.

Caldwell, T.E. (1971). Teacher Training Tools for Precision. Let's Try Doing Something Else Kind of Thing. Arlington, VA: Council for Exceptional Children.

California State Department of Education. (1980). Report on the Special Studies of Selected ECE Schools with Increasing and Decreasing Reading Scores. Sacramento, California: Office of Program Evaluation and Research.

Calkin, A.B. (1979). Measuring and Comparing Perceived Facts, Fun and Freedom. Unpublished Doctoral Dissertation, University of Kansas.

Calkin, A.B. (1981). One Minute Timing Improves Inners. Journal of Precision Teaching, 2:3, 9-21.

Conser, L.R. (1981). Charting: The Quick Picker Upper. Journal of Precision Teaching, 2:3, 27-29.

Conser, L.R. and Bower, R.L. (1981). Frequency of Sixth Graders' Positive and Negative Thoughts As a Measure of Participation in an Original Social Simulation Game. Paper presented at the 7th Annual Convention for Applied Behavior Analysis, Milwaukee, WI.

Cortis, S.A. (1919). Measurement of classroom products. General Education Board, New York.

Duncan, A.D. (1971). Precision Therapy is the Way to Go. Let's Try Doing Something Else Kind of Thing, Arlington, VA: Council for Exceptional Children.

Duncan, A.D. (1971). The View from the Inner Eye: Personal Management of Inner and Outer Behaviors. Teaching Exceptional Children, Spring, 152-156.

Eaton, M. and Lovitt, T. (1971). Achievement Tests vs. Direct and Daily Assessment. Working paper, University of WA.

Eaton, M. and Fox, S. (1983). Using Precision Teaching to Teach Precision Teaching. Journal of Precision Teaching, 3:4, 91-96.

Edmonds, R. (1979). Effective Schools for the Urban Poor. Educational Leadership, 37, 15-27.

Eshleman, J.W. (1984). All the Known Precision Teaching References. Journal of Precision Teaching, 4:3, 56-66.

Flanagan, P.H. (1982). Improved Student Learning Through Decentralizing Curricular Decisions. Unpublished Doctoral Dissertation, University of Kansas.

Flanagan, P.H. (1983). Discipline in an Elementary School. Journal of Precision Teaching, 4:2, 42-43.

Fox, S. (1982). Has Precision Teaching Made an Impact in the Field of Education? Journal of Precision Teaching, 3:2, 34-38.

Gayler, D.E. (1984). Less Than 4 Hours to Fluent Library Locational Skills. Unpublished manuscript, University of Kansas.

Glenn, B.C. (1981). What works? An examination of effective schools for poor black children. Cambridge, Massachusetts: Center for Law and Education, Harvard University.

Good, T.L. (1979). "Teacher Effectiveness in the Elementary School. Journal of Teacher Education, 30:2, 52-63.

Haring, N.G., Lovitt, T.C., Eaton, M.D., Hansen, C.L. (1978) The Fourth R: Research in the Classroom. Columbus, OH: Charles Merrill.

Hastings, A.H. (1983). Snipping the Strings: Local and State Administrators Discuss Chapter 2. Phi Delta Kappan, 66:3, 194-198.

Haughton, E. (1971). Aims Growing and Sharing. Let's Try Doing Something Else Kind of Thing. Arlington, VA. Council for Exceptional Children, 20-39.

100 Jackson, P.W. (1968). Life in classrooms. New York: Holt, Rinehart and Winston.

Johnson, E.C. (1971). Precision Teaching Helps Children Learn. Teaching Exceptional Children, Spring, 129-136.

Johnson, N. (1971). Precision Teaching Cuts Across Cultural Lines. Let's Try Doing Something Else Kind of Thing. Arlington, VA: Council for Exceptional Children, 84-89.

Johnson, T.S. (1971). Precision Therapy is the Way to Go. Let's Try Doing Something Else Kind of Thing. Arlington, VA: Council for Exceptional Children, 40-50.

Koenig, C. H., (1972). Charting the Future Course of Behavior. Kansas City, KS: Precision Teaching Media.

Kunzelmann, H.P., Cohen, M.A., Hulten, W.J., Martin, G.L. Mingo, A.R. (1970). An Initial Training Sequence: Precision Teaching. Seattle, WA: Special Child Publications.

Kunzelmann, H.P. (1971). For Successful Program Maintenance Look at the Data First. Let's Try Doing Something Else Kind of Thing. Arlington, VA: Council for Exceptional Children, 118-127.

Leithwood, K.A., and Montgomery, D.J. (1982). The Role of the Elementary School Principal in Program Improvement. Review of Educational Research, 52:3, 309-339.

Lessard, B.E.(1979). Charting Positive and Negative Behaviors in an Elementary School and Classroom. Unpublished Doctoral Dissertation, University of Kansas.

Levine, D.U. and Stark, J.(1981) Extended summary and conclusions: institutional and organizational arrangements and processes for improving academic achievement at inner city elementary schools. Kansas City: Center for the Study of Metropolitan Problems, University of Missouri, Kansas City, Missouri.

Lezotte, L.W. (1982). Characteristics of Effective Schools and Programs for Realizing Them. The Education Digest, 48:4, 27-29.

Lindsley, O.R. (1971). From Skinner to Precision Teaching: The Child Knows Best. Let's Try Doing Something Else Kind of Thing. Arlington, VA: Council for Exceptional Children. 1-11.

Lindsley, O.R. (1983). Supervision of Teaching, Educational Microcomputing, and Administrative Behavioral Planning Lectures. University of Kansas.

Lovitt, T.C. (1977). In Spite of My Resistance...I've Learned From Children. Columbus, OH: Charles Merrill.

Mahan, L., Barkmeier, V., DeMarco, V. (n.d.). Charted Measure of an Entire Workshop's Progress. Unpublished manuscript. Walnut Street and Eunice Kennedy Schriver Center.

Mann, D. (1978). Making Change Happen. New York: Teachers College Press.

Martin, G.L. (n.d.) Precision Teaching in the Classroom. Unpublished manuscript, Experimental Education Unit, University of Washington.

McDade, C.E., Rubenstein, S.B., Olander, C.P. (1983). Parallel Between Frequency Testing and Performance on Essay Questions in a Theories of Personality Course. Journal of Precision Teaching, 4:1, 1-5.

Merbitz, C.T. and Olander, C.P. (1980). Precision Teaching in a University Center. Journal of Precision Teaching, 1:1, 18-26.

Miller, J.E. and Calkin, A.B. (1980). Using Precision Teaching in a Secondary Science Class. Journal of Precision Teaching, 1:2, 10-17.

Murname, R.J. (1981). Interpreting the Evidence on School Effectiveness. Teachers College Record, 19-34.

Neale, D.C., Bailey, W.J., Ross, B.E. (1981). Strategies for School Improvement. Boston: Allyn and Bacon.

Nevo, D. (1983). The Conceptualization of Educational Evaluation: An Analytical Review of the Literature. Review of Educational Research, 53:1, 117-128.

Parish, R. and Arends, R. (1983). Why Innovative Programs are Discontinued. Educational Leadership, 40:1, 62-65.

Peterson, C. and Holman, R. (1984). Group Language Activity to Increase Recall Facts. Journal of Precision Teaching, 4:4, 85-88.

Purkey, S.C. and Smith, M.S. (1983). Effective Schools: A Review. The Elementary School Journal, 83:4, 427-449.

Sarason, S.B. (1982). The Culture of the Schools and the Problem of Change, 2nd ed. Boston: Allyn and Bacon.

Soar, R.S., Medley, D.M., Coker, H. (1983). Teacher Evaluation: A Critique of Currently Used Methods, Phi Delta Kappan, 65:4, 239-246.

Sokolove, H. (1978). Blueprint for PRODUCTive Classrooms. Shawnee Mission School District. ESEA Title IV-C. Kansas State Department of Education.

Starlin, C. (1971). Peers and Precision. Teaching Exceptional Children, Spring, 106-110.

St. John, W. (1982). Effective Planning, Delegating, and Priority Setting. NASSP Bulletin, 66, 16-24.

Sweeney, J. (1982). Research Synthesis on Effective School Leadership. Educational Leadership, 346-352.

Thomas, P. (1983). A Summary of Current Studies About Education. Focus - Kansas State Department of Education December, 1-8.

Thomsen, S. (1981). Articulation and Language Therapy Using Precision Teaching. Journal of Precision Teaching, 2:3,

Van Meter, E.J. (1980). Planned Change in Education. Administrators Notebook, 28:7, 1-4.

Van Meter, E.J. (1982). The Perspectives Model: Alternative Approach to Planned Educational Change, Administrators Notebook, 30:3, 1-4.

Weick, K.E. (1976). Educational Organizations as Loosely Coupled Systems. Administrative Science Quarterly, 21, 1-19.

Willis, B. (1974). Progress Report IV SST for Precise Educational Remediation for Managers of Specific Learning Disabilities. Child Service Demonstration Programs, State of Washington, P.L. 91-230 Part G.

Wolking, W. and Gerent, M. (1984). A Precision Teaching Database. Journal of Precision Teaching, 4:4, 77-84.

Wood, S., Burke, L. Kunzelmann, H. and Koenig, C. (1978). Functional Criteria in Basic Math Skill Proficiency. Journal of Educational Technology, 2:3, 29-36.

_____. (1984). Schools 1983: Statistics from the NEA. Education Week, 3:2, 11.

_____. (1971). Precision Teaching in Perspective: An Interview with Ogden R. Lindsley. Teaching Exceptional Children, Spring, 114-119.

Personal Communications

Beck, Ray. (May, June, 1984). Great Falls Precision Teaching Project.

Blackburn, Marie. (March, April, May, June, 1984). SIMS Project, Minneapolis.

Cox, Linda. (June, 1984). SST Project.

Diviaio, Linda. (May, 1984). Orange County Precision Teaching Project.

Downs, John. (May, June, 1984). Father Flanagan's Boys Town.

Gabriel, Suellen. (May, 1984). Great Falls Precision Teaching Project.

Goettel, Henri. (June, 1984). Shawnee Mission, Project Product.

Haughton, Eric. (June, 1984). Hastings County School District.

Heffren, Marilyn. (May, June, 1984). Orange County Precision Teaching Project.

Hively, Wells. (June, 1984). Spaulding Youth Center.

Johnson, Gwen. (June, 1984). SST Project.

Keil, Jean. (June, 1984). SST Project.

Lovitt, Tom. (June, 1984). SST Project.

Meyen, Mary Lou. (June, 1984). Spaulding Youth Center.

Nelson, Karen. (May, June, 1984). SIMS Project, Minneapolis.

Nowak, Betty. (April, May, June, 1984). Weber County School District.

Parks, Terry. (June, 1984). Shawnee Mission, Project Product.

Rotto, Ardie. (April, May, June, 1984). Bemidji Regional Interdistrict Cooperative.

Rudsitt, Jim. (June, 1984). SST Project.

Starlin, Ann. (June, 1984). Bemidji Regional Interdistrict Cooperative.

APPENDIX A

1/1.0

Precision Teaching Implementation Questionnaire

School District _____ Date _____

School _____

Principal _____ P.T. Training: Yes NO

Teacher	Grade Level	# Years Using P.T.	Currently Using P.T.		Students Charting		Teacher Charting Own Behvr.		# of Lines in Picture		Average Celerat.
			Yes	No	Yes	No	Yes	No	1	2	
1.											
2.											
3.											
4.											
5.											
6.											
7.											
8.											
9.											
10.											
11.											
12.											
13.											
14.											
15.											
16.											
17.											
18.											
19.											
20.											

PTIQ/1.0

2/1.0

Teacher	Curriculum areas in which you are using P.T.							
	Reading	Math	Spelling	Handwriting	Voc.	Science	Soc.St.	Other
1.								
2.								
3.								
4.								
5.								
6.								
7.								
8.								
9.								
10.								
11.								
12.								
13.								
14.								
15.								
16.								
17.								
18.								
19.								
20.								

1/4.0

Precision Teaching Follow-up Questionnaire

School District_____ Date of Initial Contact_____

Contact Person_____ Follow-up Contacts_____

Original Program Director_____ Date of Program's Beginning_____

Present Program Director_____ Date of Discontinuance_____

1. Funding Source

	LOCAL		
	General Fund	Spec. Ed.	Chap. I
Original $ Amount			
Present $ Amount			

	REGIONAL COOPERATIVE		
	Special Ed.	Other	
Original $ Amount			
Present $ Amount			

	STATE		
	Flow Thru $	IV-C	Other
Original $ Amount			
Present $ Amount			

2. What sparked original interest in P.T.? _____

Teacher Interest	Admin. Interest	Awareness Session

State Money	Federal Money	Other

3. Who is responsible for P.T. in the district? _____

Teacher		Administrator	
Reg	Sped	Bldg.	Cent. Office

New Position Created	Increased Respons. to Present Position

PTFUQ 4.0

2/4.0

4. Attitude of administrator about P.T.?

	Original			New		
	+	=	-	+	=	-
Superintendent						
Principal						
Special Ed. Director						
Program Director						

5. Reason for change of original program director of P.T.?

Discontinued position	Increased Respons. of same person

6. Original use of P.T.?

Regular Ed.	Spec. Ed.	Title I
Remedial	Other	

7. Current use of P.T.?

Regular Ed.	Spec. Ed.	Chap. I
Remedial	Other	

8. Numbers using P.T.?

Total # of each in District?

Schools	Class	Teacher	Student

9. Grade levels using P.T.?

K	1	2	3	4	5	6
7	8	9	10	11	12	Othr

3/4.0

10. Curriculum areas using P.T.?

Rdg.	Math	Spell	Engl	Scien
Soc Sc	Music	Art	PE	IArt
H Ec.	Health	Other		

11. Number of students charting?

12. Average number of areas per student (intensity of use)?

13. Estimate of celerations achieved?

*1.0	x1.25	x1.5	X2.0	othr

14. Number of lines in learning pictures?

One	Two	Three	

15. Number of teachers charting their own behavior?

16. Rewards for student learning based on P.T.?

Bldgs	Class	Teacher	Student

17. Use of P.T. in district currently is

Accelerate	Maintain	Decelerate

18. Support for P.T. in district comes from

Principals	Teachers	Students
Parents	Supervisors	Assist. Supt.
Superint.	Other	

PTFUQ 4.0

4/4.0

19. Problems encountered in implementation of P.T.

Charting	Materials	Management
Lack of Support	Lack of Trainers	Other

20. Comments:

APPENDIX B

Table B-1

Current Precision Teaching District Saturation

District	Schools			Teachers			Students		
	Total	P.T.	Ratio	Total	P.T.	Ratio	Total	P.T.	Ratio
Bemidji	29	29	1:1	300	60	5:1	1450	600	2.4:1
SST	--	--	---	---	---	----	---	---	-----
Hastings County	30	6	5:1	1200	25	48:1	15000	625	24:1
Minneapolis	53	32	1.6:1	3000	60	50:1	39000	2000	20:1
Great Falls	22	16	1.4:1	777	200	4:1	12079	2690	4:1
Spaulding	--	--	---	---	---	----	---	---	----
Shawnee Mission	--	--	---	---	---	----	---	---	----
Weber County	35	30	1.1:1	700	260	3:1	22000	4500	5:1
Boys Town	3	3	1:1	63	63	1:1	420	420	1:1
Orange County	305	160	1.9:1	4500	180	25:1	38485	4250	21:1
Totals	477	276	1.7:1	10540	848	12:1	178434	15085	12:1

Table B-2

Funding of Precision Teaching Projects

District	Amount		Source	
	Beginning	Now	Beginning	Now
Bemidji	$ 1,500	$ 300	L	L
SST	$70,000	-------	F	------
Hastings County	$ 500	-------	L	L
Minneapolis	$ 250	$25,000	L	L / S
Great Falls	$70,500	$19,000	S	L
Spaulding	-------	-------	L	L
Shawnee Mission	$85,000	-------	S	------
Weber County	$50,000	$ 2,500	S	L / S
Boys Town	$10,000	$ 2,200	L	L
Orange County	$65,000	$18,000	S	L / S
Total	$352,750	$66,000		

L= local, S= state, F= federal

Table B-3

Support Of Precision Teaching by District Administrators

District	Superint. S	Superint. N	Princ. S	Princ. N	Sped. Dir. S	Sped. Dir. N	Prog. Dir. S	Prog. Dir. N
Bemidji	N/A		=	+	+	+	+	+
SST	+	-	+	-	+	-	+	N/A
Hastings County	+	-	+	-	+	+		N/A
Minneapolis	=	+	-	+	=	+	+	+
Great Falls	+	+	=	-	+	+	+	+
Spaulding	+	-	+	-	N/A		+	-
Shawnee Mission	=	-	+	-	=	-	+	N/A
Weber County	+	=	=	+	+	+	+	+
Boys Town	+	+	=	+	N/A		+	+
Orange County	=	=	=	+	=	+	+	+
Total +	6+	3+	4+	5+	5+	6+	9+	6+

S=Start, N=Now, + Supportive, = Neutral, - Non-supportive

Table B-4

Current Support of Precision Teaching by District Team

District	Supt.	Asst. Supt.	Sped. Dir.	Sprv.	Prin	Teacher	Student	Parent
Bemidji			●	●		●	●	
SST								
Hastings County						●	●	
Minneapolis	●		●	●	●	●	●	●
Great Falls	●	●	●	●	●	●	●	●
Spaulding								
Shawnee Mission								
Weber County			●	●	●	●	●	●
Boys Town	●		●	●	●	●	●	●
Orange County		●	●	●	●	●	●	●

Table B-5

Precision Teaching by Curriculum Area

District	R	M	S	E	Sc	SS	Mu	A	PE	HEc	He	Otr
Bemidji	●	●										●
SST	●	●	●									
Hastings County	●	●	●	●	●	●	●		●			●
Minneapolis	●	●	●	●	●	●	●	●	●	●	●	●
Great Falls	●	●	●	●	●	●	●			●		●
Spaulding	●	●	●	●	●	●	●	●	●	●	●	●
Shawnee Mission	●	●	●	●	●	●	●		●			●
Weber County	●	●	●	●	●							●
Boys Town	●	●	●	●	●	●	●	●	●	●	●	●
Orange County	●	●	●	●		●						

R=reading, M=math, S=spelling, E=English, S=science, SS=social science, M=music, A=art, PE=physical education, HEc=home economics, He=health, Oth=other

Table B-6

Frequencies of Charting

District	# of Students	# of Areas	Ave. Cel.	# of lines	# of Teachers
Bemidji	0	2	x1.4	2	0
SST					
Hastings County	300	2-3	x1.2	2	2
Minneapolis	100	2	x1.2	2	10
Great Falls	2500	2	x1.25	2	0
Spaulding					
Shawnee Mission					
Weber County	2250	2	x1.2	2	0
Boys Town	420	4-7	x1.5	2	0
Orange County	3800	2	x1.5	2	0
Totals	9370				12
Median	420	2	x1.25	3	0
Range	0-3800	2-7	x1.2-x1.5	2-3	0-12